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Pesticide Production Increases 5% in '58, Report Indicates

Tariff Commission Says 539 Million Lb. Made, Sales at \$196 Million

WASHINGTON—The U.S. Tariff Commission has released its preliminary report on U.S. production and sales of pesticides and other organic agricultural chemicals in 1958. The report, fourteenth in a series on production and sales of synthetic organic chemicals in 1958, gives preliminary statistics for that year on pesticides by principal uses—fungicides, herbicides, insecticides, rodenticides, soil conditioners, and soil fumigants.

According to the report, U.S. pro-

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Fungicide Colloquium Scheduled for Meeting

UNIVERSITY PARK, PA.—The annual meeting of the American Phytopathological Society will include a Fungicide Colloquium, announced Dr. L. Gordon Utter, of the technical advisory committee, National Agricultural Chemicals Assn.

The meeting will be held Sept. 2 at Pennsylvania State College here.

According to Dr. Utter, the main portions of the Colloquium will include:

- Current Status of Federal Controls on Fungicide, by J. A. Noone, NAC.
- Present Thinking on Mode of Action of Fungicide, Drs. Carroll Cox and Hugh Sisler, University of Maryland.
- Present Status of Use of Foliar Bactericides on Vegetables, by Dr. Robert A. Conover, University of Florida.
- Industry Presentations.

STEEL STRIKE REFLECTIONS

How is the steel strike affecting fertilizer industry customers as the work stoppage drags on? Leaders in the trade, contacted by Croplife, reminded that July and August are normally the months of lowest demand for ammonium sulfate, and consequently the shutdown has not caused any particular hardship to date on consumers.

Many of the customers who needed ammonium sulfate had anticipated their needs in advance and ordered extra tonnage during June and the first half of July to carry them over the strike period.

However, industry observers note that each day of the shutdown means loss of product that cannot be made up later, and as of now, no one can determine to what extent this will affect the industry.

Loan Approved for Insecticide Plant In Turkish Area

WASHINGTON—The U.S. development loan fund has announced approval and commitment of funds for a \$2,800,000 loan to Koruma Tarim Ilaclari A.S., a private Turkish firm, to assist in the establishment of a plant near Izmit, Turkey, for the production of insecticides, chlorine, caustic soda and by-products, from local raw materials. Details of the loan agreement are to be negotiated.

Koruma now imports DDT and BHC insecticide preparations in concentrated form for mixing into compounds suitable for direct application to local crops. The firm also carries out crop-dusting operations through an affiliated concern.

Since all basic raw materials for production of such insecticides are available in Turkey, Koruma, proposes to manufacture them itself and to expand its existing mixing and formulating operations. The main raw materials are salt, sulfuric acid, benzene and alcohol. Mercury to be used in the electrolytic process for the production from salt of chlorine and caustic soda, is also locally available.

The new plant will produce for outside sale, caustic soda and such by-products as sulphuric acid.

Safety Schools Now Under Way to Train Plant Supervisors

CHICAGO—Two of the five scheduled safety schools for the fertilizer industry have been conducted at Ithaca, N.Y. and Chicago, with the third scheduled for Aug. 27-28 in Atlanta. The remaining two, set for Fresno, Cal. and Pasadena, Texas, are to be held Nov. 5-6 and 12-13, respectively.

The five school sessions are sponsored jointly by the National Plant Food Institute and the National Safety Council's fertilizer section.

Fertilizer firms in the areas covered by the various schools send production managers, superintendents, foremen and safety supervisors to the courses.

The meeting at Ithaca, N.Y. was presided over by Stratton McCargo, GLF Soil-Building Service, with W. C. Creel, North Carolina Department of Labor and Harlan Perrins, Cornell University, included on the instruction staff.

The Chicago meeting, held Aug. 18-19 attracted fertilizer personnel from a number of midwestern states. John E. Smith, Spencer Chemical Co., Pittsburg, Kansas, was industry representative, with Mr. Creel also present. Representatives of the National Safety Council, at whose offices the school was held, were also prominent on the program.

Typical of the five schools, the Chicago meeting covered the broad scope of safety activities and applied specific detailed information to the problems of the fertilizer industry.

Roy Benson, manager of industrial sections of NSC, presented a paper on "Fundamentals of Accident Prevention," pointing out basic causes and remedies of accidents, the role of management in launching programs, the relationship between safety and plant efficiency, the high costs of poor safety records and an outline of a balanced safety program.

He described safety as a management job and an operating problem. The standards of safe conditions must be set up and checked regularly, he told the group. Supervisors must teach safe work methods and require that these methods are followed.

In order for such a program to succeed, he said, interest and enthusiasm for accident prevention

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Agricultural Research, Development Commission to Be Formed

PASSAGE by a House Agriculture Subcommittee of H.R. 8639 and H.R. 8640, bills providing for the creation of an agricultural research and development commission, is being heralded by the plant food industry as a much-needed influence in the direction of solving some important parts of the farm problem.

The bills are "clean" ones introduced by Rep. Thomas G. Abernethy (D., Miss.) and Rep. Henry A. Dixon (R., Utah), and represent a revised version of H.R. 7576 introduced in the House by Mr. Abernethy on June 4, 1959. The most significant amendment voted by the subcommittee stresses the importance of finding ways to increase industrial utilization of farm products. Another change would provide for the new agricultural research and development commission to report to the Secretary of Agriculture, rather than to the Secretary and Congress.

Purpose of the bill is to promote the effectiveness of farm research, to expand markets for farm and forestry products, to reduce surpluses, to increase farm income and to benefit consumers. In view of the history of previous efforts to accomplish these needs, the tendency may be to regard this bill as "just another one" and dismiss it as merely a noble gesture.

However, there is something fundamentally sound about the Abernethy-Dixon measure, and that is its reliance on research methods that have proved themselves so valuable in industry. In the wording of the bill, "Research can make major contributions toward expanding markets, increasing farm income, benefiting consumers and reducing surpluses through greater utilization, by its influence in cutting the costs and improving the methods of producing, marketing, processing and distributing farm products and by its influence on quality and also on new and improved processes and products."

Success for such a program may mean much to both the plant food and pesticide industries. We believe that the establishment of such an agricultural research and development commission will be a definite advantage to agriculture and the industries serving it.

Land Ownership in U.S. Little Changed In Past 14 Years

WASHINGTON—Concentration of ownership of rural land in 10 Great Plains states, containing 47% of the farm and ranch land in the United States, did not change appreciably between 1945 and 1958, a U.S. Department of Agriculture survey shows.

Even though there were fewer owners and the average size of ownership unit was increased, the proportion of land held by both small and large holders was about the same in 1958 as in 1945.

The 50% of the owners holding the smallest units of land own 8% of the acreage and 11% of the value of farm and ranch land in the ten states. Owners of the largest holdings, at the other end of the scale, number 5% of the total; they control 53% of the acreage and 36% of the land in terms of its value.

The total number of owners decreased somewhat during the period.

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ONE OF THE FIRST copies of "Soil Management in India" just off the press is presented by Roy Donahue of the Kansas State University-ICA-India team to D. S. Reddy, vice chancellor of Osmania University, where the K-State team has headquarters in India. The book represents the first Indo-American cooperative effort to produce a textbook on agriculture for use in India. It has just been published by the Asia Publishing House, Bombay, India. Mr. Donahue, an agronomist on the K-State team, collaborated with three Indian agriculture officials in writing the book. The cover symbolizes the typical "patch" farming of India.

Two Idaho Dusters Build 40,000-Acre Annual Business

NAMPA, IDAHO—Some 40,000 acres of seed and row crops in southwestern Idaho and eastern Oregon are treated each season by Clark's Flying Service and Robertson's Flying Service that maintain headquarters here.

Clark's maintains a field at Parma and Robertson's has a branch at Homedale.

Harry Clark established his field in 1939 and in early 1940s started his first crop dusting, which consisted of only a few hundred acres. He now maintains eight dusting planes and six pilots at Nampa's municipal airport, which he operates along with a flying school.

Mr. Clark recalled that when aerial land treatment started, dust was used almost entirely. Now liquid sprays are predominant and it is possible spray will be used almost exclusively because of easier application in wind and longer period of effectiveness on insects.

L. J. "Bud" Robertson established his dusting service two years ago here and maintains four planes and three pilots to cover the Snake River Valley's seed and row crop area. Early in the spring, there is demand for fertilizer work for range and dry land wheat in eastern Idaho. At the present time, the schedule is heavy for vegetable and hay crops in fields from five to 100 acres.

A crop duster pilot averages something like 32,000 air-miles of travel a season and they must be more than pilots. All of them are especially trained for their work, having to learn more details about ground-level air currents, how to overshoot obstructions and how to handle their planes' controls while they're keeping an eye on the flagman, buildings, utility lines and other obstructions below.

Two years ago, when the latest figures were tabulated, it was estimated that one out of 12 acres of irrigated land was treated by airplanes and local dusters believe the ratio is now higher, "if the demand for service in this area is any indication," Mr. Robertson said.

RICE FIELD DAY

BERKELEY, CAL.—The University of California Rice Field Day will be held Friday, Sept. 4, at the Rice Experiment Station near Biggs.

Arkansas Farmer Calls Fertilizer Key To Pasture Success

PERRYVILLE, ARK.—Jack Moore, a Perry County farmer, believes he has taken a big step toward solving the establishment of sturdy winter pasture.

"Fertilizer is the key to success with winter grazing," he says. And he has the facts and figures with which to back up his statement. Joe Bradley, county agent, also agrees with Mr. Moore's findings.

A well-fertilized, six-acre fescue and white clover pasture carried a cow and six calves all winter and well into the spring, Mr. Bradley reports.

Mr. Moore fertilized his small experimental plot after a soil sample showed the land to be very low in pH. University of Arkansas agronomists recommended three tons of lime per acre before application of fertilizer.

The lime was applied in August and worked into the soil as thoroughly as possible. Then, each acre got 30 lb. of nitrogen, 60 lb. of phosphate and 30 lb. of potash—applied as 10-20-10.

To complete the program, 3 lb. of white clover and 20 lb. of fescue were seeded last September. With good moisture, the young pasture grew well.

All the cattle received was a half-bale of hay to supplement their pasture forage. Mr. Moore estimated each of the animals had gained 125 lb. during the winter—a good gain at little expense.

Mr. Moore credits the proper use of fertilizer with bringing the pasture through the winter in good shape. And the experiment takes on added significance because it was a new stand of grass.

Two Types of Blight Hit Texas Cotton Fields

PECOS, TEXAS—Two types of blight have damaged the cotton crop of this area. These are angular leaf spot and verticillium wilt.

Angular leaf spot can reduce yields from 20 to 25%, according to Ernest Thaxton, supervisor of the Trans-Pecos Experiment Station. Angular leaf spot is sometimes called "black arm" when found on the plant stem.

Verticillium wilt dries up the water-conducting tissues of the leaf, causing part of the cotton stalk to die.

USDA Urges Reports on Any Unusual Insects, or Damage Done to Crops and Gardens

WASHINGTON—Unexplained damage to crops, lawns, gardens, trees, and shrubs may mean the presence of a new plant pest, according to the U.S. Department of Agriculture. Persons acquainted with the damage of common agricultural pests—particularly insects, have been asked to report to their county agricultural agent any unusual damage.

Alertness on the part of those working daily with plants and crops could speed up detection of any foreign pests that might successfully make their way past quarantine barriers into the United States, or of pests already in this country that have spread into areas where they were not previously established.

Such public cooperation is essential to success of a stepped-up nationwide detection program "to stop plant pests before they start," now being carried forward by the agricultural research service. ARS is cooperating in the effort with research, survey, extension, and regulatory services of several state and federal organizations. Early pest detection has repeatedly proved economical by saving money and effort and by preventing damage to U.S. farms and forests, USDA says.

It was a home owner, who, while trying to determine the cause of damage to her lawn, first discovered the European chafer at Brooklyn, N.Y., about a hundred miles from the nearest known location of the destructive turf pest. A Miami Shores, Fla., resident, curious about the larvae he found in grapefruit in his backyard in April, 1956, triggered a successful campaign to rid the United States of

Massachusetts Mosquito Invasion 'Worst in History'

BOSTON—Daily spraying has been urged as a health measure for the worst invasion of mosquitoes in the history of southeastern Massachusetts.

The reclamation board of the State Department of Agriculture calls the situation "out of control." Conditions are ripe for an outbreak of encephalitis—sleeping sickness, said Dr. F. Rudolph Philbrook, assistant director of the division of communicable diseases. He says his department is watching closely for evidence of sleeping sickness.

Bertram I. Gerry, executive secretary of the reclamation board of the State Department of Agriculture, terms the mosquito invasion the worst in the history of the state. He said his department and the county mosquito control projects just can't keep up with the invasion.

He recommended a daily spraying program in the homes, as well as having children sleep under a protective cover of mosquito netting.

The record 17 in. rainfall of June and July wiped out all the earlier precautionary measures of control started early in the season. Mr. Gerry's department had sought out the breeding places of the mosquito, spraying swamps, low lying areas and stagnant pools. This is done before the foliage appears on the trees, for foliage serves to screen many places and prevent the spray from reaching the ground, he said.

The state division of communicable diseases reported Aug. 17 that the following two weeks are "critical."

Dr. Philbrook said: "So far, we have found no evidence that the virus is active in the southeastern part of the state—the only area where it ever has affected humans. There have been three epidemics in this part of the state—in 1938, 1955 and 1956."

the potentially destructive Mediterranean fruit fly.

Although many insect pests exist in the United States, they represent only about a third of the world's total of destructive insect species. About 20,000 species of insects not found in the United States cause damage to crops in other parts of the world.

Reports from laymen, supported by specimens for identification, will immeasurably aid organized activities in pest-detection all over the nation, it is emphasized. State interest in insect pest surveys has increased in recent years. A number of states have accumulated extensive records of insects within their borders; others have long-range plans for comprehensive insect studies.

Great Plains Council Plans Varied Research

SANTA FE, N.M.—The Great Plains for the first time is tackling some of its most pressing problems with region-wide research—weather, dryland farming, wheat, state and local taxes, grasshopper control, and the restoration of abandoned acres to grass.

These were some of the highlights coming from the recent annual meeting of the Great Plains Agricultural Council here. The council is composed of heads of the agricultural extension services and agricultural experiment stations of the land-grant colleges and universities of the region and U.S. Department of Agriculture agency leaders.

Two research projects—on operating dry-land farms and on state and local taxes—were started July 1. Agricultural experiment stations in Oklahoma, Kansas, Nebraska, and Montana, and USDA's Agricultural Research Service are cooperating in the dry-land farming project, with South Dakota expected to enter the project Jan. 1. Tax research is underway in New Mexico, Nebraska, Montana, and Kansas, with support from the research service.

Two other projects—on weather "patternning" and grasshopper populations—will be started in September. Participating states in the effort to get a better understanding of the region's extremes of weather are Kansas, Montana, Nebraska, North Dakota, and Wyoming. Research on the crop and range destroying 'hoppers will be undertaken in Kansas, Nebraska, North Dakota, and Colorado, also with an assisting project by the research service.

Dr. G. H. Starr, director of the Wyoming Agricultural Extension Service, University of Wyoming, Laramie, was elected chairman of the council. He succeeds Dr. Louis E. Hawkins, director of the Oklahoma Agricultural Experiment Station, Stillwater. Thomas M. Potter, Kansas state director of the Farmers Home Administration, Manhattan, was named vice chairman. John Meuhlbeier of the Agricultural Research Service, U.S. Department of Agriculture, Lincoln, Neb., was renamed secretary of the council.

Other executive committee members are: E. J. Haslerud, director, Agricultural Extension Service, North Dakota Agricultural College, Fargo; E. D. Hurd, Montana state conservationist, Soil Conservation Service, Bozeman; E. J. Hildreth, Texas Agricultural Experiment Station, Lubbock; John Rauh, chairman, State Agricultural Stabilization and Conservation Committee, Stillwater, Okla., and Dr. Hawkins, immediate past chairman.

The council voted to hold the 1960 meeting in Laramie, July 28-30.



Kenneth J. Dietzen

THE APPOINTMENT of Kenneth J. Dietzen as Assistant Southern Regional Manager, Merchandising Sales, has been announced by E. L. Stripling, Jr., Calspray's regional manager for this area. The appointment, effective immediately, moves Dietzen from the district office in Maumee, Ohio, to regional headquarters in Atlanta, Ga. California Spray-Chemical Corp. is the manufacturer of the Ortho line of insecticides, fungicides, fertilizers and weed killers.

Monsanto Announces Personnel Appointments

ST. LOUIS, MO.—The creation of two new executive positions paced several key personnel changes announced recently by Monsanto Chemical Co.'s organic chemicals division. All are effective immediately.

J. Paul Ekberg, Jr., of St. Louis has been appointed product director of agricultural chemicals, and Reinhard S. Wobus of Belleville, Ill., has been appointed product director of petroleum chemicals and functional fluids. Mr. Ekberg moves up from assistant director of sales and Mr. Wobus from technical production manager of the division.

In announcing the appointments, Robert M. Morris, Monsanto vice president and general manager of the division, said that Mr. Ekberg and Mr. Wobus, as product directors, will plan and coordinate all of the division's activities relating to their assigned product groups with responsibility for both profitability and growth. They will report to the assistant general manager of the division.

H. James Lawler of St. Louis, an assistant director of sales, has been appointed director of sales planning for the division, filling a position vacant since last June 16.

Desmond B. Hosmer of St. Louis, manager of production planning and control for the division, has been appointed a technical production manager, succeeding Mr. Wobus.

Dr. Norris L. Sample of St. Louis, production coordinator for the division, has been appointed manager of production planning and control, succeeding Mr. Hosmer.

Tax Equality Chairman Resigns Position

RICHMOND, VA.—Joseph A. Howell has announced his resignation from the position of chairman of the Fertilizer Committee for Tax Equality. At the same time, he indicated that he will not continue as a consultant to the National Tax Equality Assn.

Mr. Howell is well known in fertilizer business circles, having held the position of president of Virginia-Carolina Chemical Corp. and official posts in the American Plant Food Council, now part of the National Plant Food Institute. He had headed the Fertilizer Committee for Tax Equality for the past year.

Fifty Soil Fertility Demonstration Plots Operating in Five Counties of Tennessee

KNOXVILLE, TENN.—The Tennessee soil fertility demonstration program is well underway with an average of more than 50 demonstrations in each of the five "pilot" counties, it is reported. "The best way to get a county program underway is to demonstrate experiment station findings at the local level," according to Dr. W. D. Bishop, University of Tennessee extension agronomist.

Many farmers are reluctant to adopt new practices and can give many reasons why something will not work on their farms. To overcome this natural resistance, Dr. Bishop and his co-workers decided to embark upon an intensified program of fertilizer demonstrations so that there would be several local examples of what could be expected from following fertilizer recommendations based on soil test information. They felt that with enough nearby success stories even the most chronic doubter would be convinced.

The general plan was for the demonstrations to be of three types: first, get the farmer to treat a field according to soil test recommendations and leave a check plot; second, if not a whole field, try an acre with a check plot; third, a plan that was well suited to the more reluctant prospect, the county agent and his co-workers treated a one-twenty-fifth acre plot according to the soil test recommendation and the remainder of the farmer's field served as the comparison plot. The agents did most of the work themselves including furnishing the fertilizer which was donated by local fertilizer dealers.

The agents report that all the fertilizer companies doing business in their counties have cooperated by donating materials. The agents also feel that the dealers could further benefit their business by taking customers (the farmers) to see the demonstrations and basing their sales approach on the benefits to be derived by using soil tests and following the recommended rates of fertilizer and lime.

The Tennessee demonstrators were also aware that if the most benefit was to be derived from the plant food, other crop production practices had to be followed also. Using the soil test as the starting point, these workers,

with the help of Joe Matthews, assistant agronomist in charge of soil testing, sought to encourage the farmers to adopt a complete crop production program including soil selection, recommended rates of fertilizer and lime, adapted varieties, time of planting, adequate crop stands, proper weed control, proper stage of harvesting, etc.

Demonstration sites were well marked with attractive metal signs in the University of Tennessee school colors of orange and white with black lettering. When the demonstrations show a visual difference between treatments, smaller signs 14" x 21" are placed on the different treatments. These small signs list the soil test levels and the lime and fertilizer used.

The next phase of the Tennessee program is scheduled for this fall, when an intensified promotional program to encourage soil testing will get underway, making use of the information collected from the demonstration phase of the program now in progress. This phase will point out the advantages of using fertilizer and lime as needed based on soil test results. This work is supported in part by a grant from the National Plant Food Institute.

James Totman Leaves Summers for New European Duties

BALTIMORE—James C. Totman, vice president of Summers Fertilizer Co. of Baltimore, Md., and Northern Chemical Industries of Searsport, Maine, has resigned from both companies as of July 31, 1959. He and his family expect to establish themselves shortly in Geneva, Switzerland.

Mr. Totman has been connected with the above companies for the past twelve years in the sales and administrative divisions. While manager of the Bangor, Maine, offices, he was also interested in city and state politics. He was chairman of the Bangor city council for three years and member of the state legislature for eight years. In Geneva, he plans to represent American industries operating in Western Europe.



SOYBEAN CONTRASTS—Differences between soybean plants treated with molybdenum and untreated plants are noted by Frank Van Horne, Sikeston, Mo., farmer, one of a group who experimented with the trace element this year. Sponsored by Climax Molybdenum Co., the project called for seed-treating of soybeans in certain fields and leaving check plots for comparison. In the photo, Mr. Van Horne holds two random samples of soybean plants picked from his fields. On the right, a molybdenum-treated plant and the other, an untreated plant. Differences were most pronounced in root size and foliage, the investigators noted. Molybdenum tests have been under way in various parts of the world for a number of years, with notable success in Australia and the Pacific Northwestern part of the U.S. The Missouri soybean tests represent the first general use of the trace element in Missouri.

Mississippi Crops 'Best in Years,' County Agents Say

STATE COLLEGE, MISS.—Most crops in Mississippi looked better during August than at the same dates for the past several years, reported county agents of the agricultural extension service.

Farmers are poisoning to control cotton insects. Many harvested silage or hay during the week.

Cotton is making excellent growth. Corn is fair to good. Pastures and cattle are in good condition. Some areas need rain.

"Cotton in Lafayette County is well fruited and as free of weevils as any crop year for the past 10 years," said John R. King, county agent. Corn and pastures are also the best in several years.

The Tate County cotton crop looks good and prospects are bright if farmers can control insects, said George Rone, county agent. Boll weevils are increasing in many fields, especially where a close poisoning schedule has not been followed.

Spider mites have shown up in many fields and boll worms in a few, Mr. Rone added.

Corn, pastures, cattle and soybeans all look good in Tate County. Farmers are harvesting silage.

"If cotton continues to do as well through August as it has thus far, Carroll County should reach its five-year goal of 650 lb. of lint per acre this time," said Richard A. Cooper, county agent. "While insects have increased in some fields due to the recent rain, they are generally being kept down to a satisfactory level."

Washington County farmers are giving boll worms more attention than boll weevils. Many farmers are fallowing land on which they will plant fall and winter grazing crops.

In Franklin County, high corn yields are expected, said John W. Cox, county agent. Pastures and livestock are in excellent condition. Boll weevils and boll worms have done some damage in cotton fields.

"Cotton in Tishomingo County is fruited heavily, with the present prospect good," reported W. C. Hamilton, county agent. The boll weevil infestation increased during the week, and farmers were busy applying poison.

Corn prospects for Tishomingo County are fair, as the weather has not favored this crop.

Lowndes County needs rain badly, as crops are beginning to suffer, stated W. B. Latham, county agent. Pastures still look fairly good. A lot of hay has been harvested recently. Weevils are building up in fields of younger cotton.

Forrest County farmers are putting in silage, said W. W. Kennedy, county agent. The cotton crop looks promising, and most farmers are still carrying out insect control programs. Many farmers are saving hay.

Herbicide Use Feature Of Weed Conference

MEMPHIS, TENN.—Recent progress in the use of herbicides to control weeds in all phases of southern agriculture will be featured during the Thirteenth Annual Southern Weed Conference scheduled to be held in Biloxi, Miss., Jan. 20-22, 1960.

V. S. Searcy of the Alabama Agricultural Experiment Station, Auburn, Ala., conference president, announced that all phases of research and education in chemical weed control will be reviewed during the three-day conference.

The program is now being prepared and will be announced prior to the meeting. Dr. D. E. Davis of the Alabama Agricultural Experiment Station is serving as chairman of the program committee for the 1960 meeting.

All sessions of the conference will be held at the Buena Vista Hotel, Biloxi. Conferencees are expected to make their own hotel accommodations.

croscopic mites that transmit wheat streak mosaic disease," Mr. Roselle pointed out.

Plowing under infested stubble will reduce the number of Hessian flies which will emerge this fall, he said. Destroying volunteer wheat also will reduce the number of flies that can over-winter to re-infest fields next spring.

"If we have a wet fall, it may be necessary to plow down volunteer wheat more than one time. Last year, a second fall brood in volunteer wheat resulted in infestations in many later planted fields," Mr. Roselle added.

Chemicals also can be used for volunteer wheat control. Chemicals should be applied about four weeks before planting fall wheat. For control recommendations farmers should check with county extension agents, Mr. Roselle advises.

Boll Weevil Counts Vary in Georgia Cotton

ATHENS, GA.—Square counts were made in 18 of 38 cotton fields surveyed in middle and south Georgia. The percent of punctured squares ranged from 20 to 85, averaging 64%.

Bollworm egg counts were made in 38 cotton fields in middle and south Georgia with a range from 0 to 14 per 100 terminal buds, averaging two per 100 terminal buds. Larval counts ranged from 0 to 12 per 100 terminal buds, averaging seven.

Cotton aphid infestations were light to moderate with most fields having light infestation.

Spider mite infestations were light to moderate with most fields having a moderate infestation.

Light to moderate infestations of cabbage loopers were noted, with most fields ranging to moderate.

A moderate infestation of brown stink bugs was found in one cotton field in Wayne County.

Heavy infestations of cutworms were found on pimento pepper in Troup County.—W. C. Johnson.

'Hoppers Hit Hard In Ohio Farming Area

HAMILTON, OHIO—Swarms of grasshoppers within the last few days have invaded the farming area west of Hamilton causing extensive damage to field crops, Robert E. Wilson, county agricultural agent, reported.

Crops damaged considerably include field corn, sweet corn and hay, while shrubs, trees and flowers also have suffered from the grasshopper swarms, Mr. Wilson said.

Farm hardest-hit is that of Mr. and Mrs. Joseph Tolley, 2660 Timberman Rd., where the insects have nearly ruined the hay crop, about eight acres of field corn and several acres of sweet corn.

The grasshoppers are concentrated on the Tolley farm where the situation seems to have reached "plague" proportions.

"They're terribly bad," said Mrs. Tolley. "We first noticed them about a week ago and they keep getting thicker. They strip the corn and the field corn ears that are still soft.

"In the evenings they swarm near the house and buildings and just cover the fence posts, flowers and corn cribs. The family has lived here for 35 years and there's never been anything like this.

"They've got a good start on our corn now and almost too much damage has already been done," Mrs. Tolley pointed out. She saw the humorous side of the situation also: "They're really big ones. Fishermen would have a field day collecting bait."

She and her husband estimated their loss at several hundred dollars with the figure likely to go higher.

Extensive damage has been reported on the 150-acre farm of Dewey Maddox, 1721 New London Rd. "My hay crop has been damaged at least 25%," he said, "and they're working the outside rows of the corn pretty well.

"They start on the outside rows of

corn and keep right on toward the middle of the field."

"The weather apparently has been just right for the grasshoppers this year, and because of the dryness they seem to have left the grassy areas and moved to the corn," Mr. Wilson said.

As a precautionary measure, Mr. Wilson advises farmers to spray the outer few rows of corn to create a barrier against the swarms. He also urges spraying of grass areas near corn if the insects are appearing in large numbers.

"The area west of town is the only one reporting damage," the agent reported.

Robert Holdsworth, state extension entomologist, Ohio State University, Columbus, in discussing the problem recently with Mr. Wilson, said the grasshoppers are "likely to be around in large numbers for quite a while."



Insect Activity in Kansas Continues to Be Varied

MANHATTAN, KANSAS—Grasshoppers continued to be the most reported insect in Kansas. The remarks, however, did show them to be greatly decreased in numbers. There were a few reported in hay crops and corn, and a few big ones in draws and weeds.

The spotted alfalfa aphid increased rapidly, especially in the Arkansas Valley and in north central Kansas. Honey dew was present in some fields, indicating an urgency to control. The aphids cause serious damage in a short time.

Corn earworms and fall armyworms have started infesting heads of milo and maize.

Flies on cattle continue to be very pestiferous. Horn flies, stable flies and horse flies seemed to be the worst.

Box elder bugs began to show up in western Kansas. And recluse brown spider has been found as far west as Garden City, with reports coming in from Barton, Lincoln and counties further east.—Philip H. Marvin.

Boll Weevil Migration In Tennessee Cotton

KNOXVILLE, TENN.—Some boll weevil migration is taking place at this time. Weevils are leaving the

fields that are cutting out and are moving to the fields that are not maturing as fast.

Controls have been very effective and the dry weather is helping control in the fields where the cotton is not so rank.

No infestations have been found in the northern portion and counts were down. They averaged 24% as against 27% at last report.

Boll worms are increasing slightly, but control is not needed where the weevil is not a problem.

Moderate infestations of plant bugs were found in Henderson County. Most fields surveyed were infested.

Spider mites were found in 76% of the fields surveyed. At least two species were present. Mites were maturing some entire fields while other infestations continued to cause severe spot damage. Controls are definitely in order. The heaviest infestations are in the northwestern part of the cotton growing area. The infestations will increase rapidly if the dry weather continues.

Aphids were decreasing slightly but were present in most fields. Infestations were far heavier in cotton treated for boll weevil.—R. P. Mullett.

Lygus Infestations Term 'Serious' Over Arizona

PHOENIX, ARIZ.—Lygus continue to be a serious problem in all parts of Arizona, and controls will still pay dividends.

In Maricopa County, the lygus was still found as the number one insect. Many fields that were previously treated now show as many as 50% of the squares injured by another lygus buildup.

Beet armyworms continue to be a problem in some Maricopa County fields, however good controls are being secured in most cases.

Some salt marsh caterpillars were also appearing, along with some leaf perforators, but infestations were considered generally too low to warrant controls. If lygus is controlled correctly, the other insects will be controlled at the same time.

In Graham County, the county agent found most fields needed lygus controls, and stink bugs were very numerous in some fields.

Harlequin cabbage bugs were also injuring bolls in some fields and a few bollworms were showing up in some Graham County fields.

A lygus count in Greenlee County found 10 to 40% injured squares in some fields. A few bollworms and

harlequin cabbage bugs were also present.

The Cochise County agent reported counts ranging from 20 to 35% of squares injured by lygus. A few bollworms also showed up.

Lygus, beet armyworms, bollworms and loopers were still active in Pima County. Controls were needed in many fields. Lygus counts ranged from 25 to 40% of squares injured.

In Pinal County, lygus counts ranged from 10 to 50% of the squares injured. Loopers, bollworms and cotton leaf perforators were starting to show up. Bollworms needed control in some fields. Beet armyworms were still a problem in some areas.—J. N. Roney.

Field Day at California

HOPLAND, CAL.—Progress in controlling Medusa head on California rangelands will be a feature topic of the 1959 Hopland Field Day on Tuesday, Sept. 22, at the University of California's range research station near here.

Use of fire, chemicals, grazing, and seeding to control this number one range weed pest will be covered on the program, according to A. H. Murphy, superintendent of the station.

The Medusa head work will be shown on an afternoon tour of the station on typical north coastal range country of Mendocino County. Methods of converting brush to grass by use of fire, chemicals, seeding, and fertilization will also be shown on the tour.

The program will start at 10 a.m., with the morning session being devoted to sheep, deer, and rodent research at the station.

The University's Hopland Field Day, usually held in May, has been shifted to September this year to present new aspects of the rangeland and sheep work, Mr. Murphy said.

NORTH CAROLINA WINNER

WASHINGTON—The 1959 recipient of the Agronomy Achievement Award at North Carolina State College was Edgar L. Boyd who was selected as the outstanding junior in agronomy. The award is sponsored by the National Plant Food Institute and includes a cash grant of \$200. In addition to the grant, Mr. Boyd received a key engraved with his name and a plaque which is retained by the college.

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Weather Modification in North America

THE statement of Dr. Vannevar Bush, printed elsewhere with this article, suggests quite clearly that the whole question of weather modification in North America—very much in the news of recent years and still by the nature of things a highly controversial subject must so remain until there is a great deal more knowledge of weather processes generally. This perhaps is the most important truth to grasp. Nor is anyone more acutely aware of it than the scientist himself. Of this we shall have more to say. What of the farmer, however, who is, perhaps, being asked to vote on commercial weather modification services in his particular area?

The Farmer Must Be Kept Informed

Close to home, the plebiscite relating to weather modification operations in west-central Saskatchewan, held some time ago, was interesting to the extent that it gave some indication of how the Western Canadian farmer is inclined to view rain-making possibilities through cloud seeding, even though there is, in effect, little upon which he may base his opinion and with him, it must, as yet, be largely a matter of faith. In the eleven municipalities concerned, a little more than one third of the voters, by voting "yes," seemed prepared to take a chance that cloud seeding operations might add to the rainfall which occurred naturally, while the other two thirds were either skeptical of man-made schemes to increase rainfall or voted "no" for some other reason. Had the figure been reversed, the scheme would have carried and the farmers concerned would have been directly assessed the cost of cloud seeding operations during a five-year period. The importance of farmers being kept as fully informed as possible about cloud seeding and weather modification is, therefore, very apparent.

It would be a mistake to assume that the Saskatchewan plebiscite has written "finis" to current attempts at weather modification in Western Canada on a commercial scale. Undoubtedly, commercial efforts to suppress hail will continue in Alberta and cloud seeding operations may, of course, be conducted elsewhere in the prairie provinces. What the plebiscite does probably mean, however, is that, for the time being at least, there may be some slowing down in commercial operations. Perhaps this is all to the good for it should provide an opportunity for strictly scientific organizations to do some extensive and very necessary basic research work in this still new and relatively unexplored field. All are agreed, in fact, that, because of the complex nature of the investigations required, such a program may take years of intensive effort.

The Necessity for Scientific Appraisal

It is now just 10 years since the first attempts to create additional precipitation by artificial means were conducted by the National Research Council with the cooperation of the Meteorological Service of Canada. These early seeding experiments, involving the use of dry ice and aircraft were only some of the many experiments which at the time were being

carried out in other countries as well. Since then, the experience gained both from scientific research and from the evaluation of commercial undertakings has added considerably to the store of knowledge which should eventually provide a clear and definite answer on the effectiveness of various forms of weather control. As meteorological officials have pointed out, the need for this answer is very real. It is important to agriculture, forestry, hydro-electric interests and, for obvious reasons, to the prairie grain grower, the market gardener and, in fact, all those concerned with conserving or augmenting water resources.

Scientific Organizations Probe the Problems

In Canada the necessity for a scientific and impartial appraisal of the physical principles involved as well as the techniques proposed have been accepted by the scientific organizations best able to give an unbiased answer. These are the government weather service, the universities, the research councils of Alberta and British Columbia and the National Research Council. These organizations have concerned themselves not only with the possibility of increasing rainfall through cloud seeding but also with the matter of hail suppression. Systematic evaluation of cloud seeding operations to induce rainfall, conducted between the years 1951 and 1956, has been made in Quebec, Manitoba, Saskatchewan and British Columbia and hail suppression operations in Alberta during the past three seasons have been carefully studied by the "Stormy Weather" Research Group of McGill University under a pilot project initiated in 1956 by The Research Council of Alberta, the National Research Council, and The Meteorological Branch, Department of Transport. While it will not be possible in these articles to deal with hail suppression, reference will be made later to some of the conclusions reached in Canada on attempts to induce rainfall.

In the U.S., considerable work has been carried on since the occasion some 13 years ago when dry ice was first dropped into a cloud in New England. Here, the American Meteorological Society issued one of its periodic statements on the scientific aspects of weather modification and

control on April 30, 1957. This society, composed of nearly 6,500 members, is the professional and scientific organization which represents weather men throughout the Americas. The statement referred to, considered important, has unfortunately been given too little prominence in Canada. Although space will not permit us to publish the full text of the statement, we shall draw attention to some of the main conclusions reached by this body.

Also important has been the work of the special U.S. Advisory Committee on Weather Control which was appointed in 1953 and which presented its report on Dec. 31, 1957. Available to it was a larger and more varied collection of information on cloud seeding operations than ever previously assembled. Here again, we shall give a brief summary of some of the published findings and some of the recommendations which the special committee saw fit to make at that time.

Lastly, there are a number of opinions on the subject that were brought together recently by the Canadian Meteorological Office. These include excerpts from other reports, and from the various scientific journals and papers on the subject. Any presentation of the evidence accumulated to date, would, of course, not be complete without a short summary of these scientific opinions. This, too, we shall attempt to give.

Historical Background Of Weather Modification

Let us go back to the beginning of things and, drawing our information mainly from the opening portion of the special U.S. Advisory Committee's report, give some of the historical background up to a point some 10 or 12 years ago. This point, as already indicated, really marked the beginning of recent developments in the field of weather modification. Later, we will deal almost entirely with the weight of evidence produced so far, that is to the scientific findings and opinions referred to earlier which will be summarized. Finally, mention will be made of some of the difficulties and limitations which have faced the scientist in his efforts to evaluate the seeding techniques used and to arrive at some of the answers which he must have if this work is

to proceed with any measure of success in the future.

Earlier, we observed that the really important developments in the field of weather modification date from about 10 or 12 years ago, although we shall see later that modern scientific attempts to increase rainfall actually started about 28 years ago.

Prior to that time, various methods were adopted in an effort to control or modify weather—some of the beliefs which were held now appear strange to us. In earliest times these methods usually took one of several forms, witch doctors, medicine men and charlatans all taking a prominent part. Even today, as we know, some of the rain dances of North American Indians, as well as mysterious rites of African tribes still persist. By the end of the 19th century, however, men were attempting to modify weather by the application of physical principles as well as by incantation and prayer. Thus, to the magical and religious methods was now added the scientific approach with which we are solely concerned today. Nonetheless, some of the earlier associations of rainfall with certain conditions or events—mostly man-made—do merit a passing reference.

Early Associations Attached to Rainfall

One of the earliest beliefs in man's power to influence the weather stemmed from the observation that rain followed many great battles. The observation itself was correct but the inference was wrong. Perhaps the belief arose in this way:

The majority of battles took place in regions of frequent rainfall. The warriors, in fact, made every effort to schedule the battles and their preparation during a dry spell. It is not surprising, therefore, that the next rain spell usually followed so closely on the heels of the battle as to suggest a definite relationship between the battle and the rainfall which occurred. Later, when muskets and cannons were used and even greater noise was made, still more weight was given to the argument that noise and concussion could induce condensation in the atmosphere.

As late as 1871 an American civil engineer named Powers brought out a book, "War and Weather," the main thesis of which was that the use of explosives in great battles caused significant rains. So persuasive was he with his theories that Congress was finally prevailed upon to pass a bill, in 1891, appropriating \$9,000 for the first series of federally sponsored experiments in rain making. Most of these took place in Texas during the summer of 1891, the results being inconclusive.

Another popular belief focused around the somewhat more plausible idea that conflagrations such as forest fires caused convective currents which, in turn, produced rain. Indeed there is some evidence that favors this idea, a few observations having been made of showers which developed from cumulus clouds formed over large forest fires. In 1841, James P. Espy proved the importance of convection in the formation of clouds in his "Philosophy of Storms."

Three years prior to this in a previous publication, Mr. Espy had recommended that farmers save brush

Some General Observations by A Distinguished Scientist

"We do not know whether it will be practically feasible for man to control the weather or favorably alter the climate in which he lives. Certainly some of man's acts already have an effect, usually unfortunately, upon rainfall and runoff, and hence upon the creation of new arid regions. It is entirely possible, were he wise enough, that man could produce favorable effects, perhaps of enormous practical significance, transforming his environment to render it more salutary for his purposes. This is certainly a matter which should be studied assiduously and explored vigorously. The first steps are clear. In order to control meteorological matters at all we need to understand them better than we now do . . . it is possible today to do a piece of work in this field which will render immediate benefits, and carry us far toward a more thorough understanding of ultimate possibilities. By all means let us get at it."—Dr. Vannevar Bush, chairman of the corporation, Massachusetts Institute of Technology (Dec. 2, 1957).

and waste timber to burn in dry weather to stimulate rainfall.

The coming of the airplane brought with it dozens of new schemes for trying to increase rainfall. These consisted of dropping into a cloud any of a dozen different substances ranging from "secret" chemicals to electrified sand and soapflakes. Several scientists suggested the use of extremely cold substances such as liquid carbon dioxide and even liquid air. The intention, of course, was to produce a sudden cooling which, they reasoned, would result in condensation and precipitation. As the U.S. Advisory Committee on Weather Control points out, however, early attempts to use such material as liquid or solid carbon dioxide and liquid air were done on a hit or miss basis with virtually no knowledge of the basic physical principles of precipitation.

Because the principal objective in these early trials was to produce clouds by cooling rather than to operate on existing super-cooled clouds, the efforts failed.

Again, coming down to the postwar period, we find that the belief has sprung up and still persists with many that atomic blasts have, in one way or another, materially affected the behavior of the weather. However, when we consider the very large areas covered by even average storms, the effects of a nuclear explosion, so devastating locally, are believed to have no effect on large scale weather modification. In this connection, we find the following statement in the final report of the U.S.A. Advisory Committee on Weather Control: "None of the data received by the Advisory Committee supports the theory that atomic bomb explosions, or any other activities of man, can have or are having large scale or far-reaching effects on the weather."

Further, during the course of the Eighth Session of the Executive Committee of the World Meteorological Organization, held in Geneva in 1956, it was agreed "that on the evidence available there was no reason to conclude that the nuclear explosions, which have so far occurred, have had any large scale effects on the weather."

It is very easy, it seems, to jump to conclusions and to claim a definite correlation between either natural phenomena or new technical developments and the weather. We have only to glance back over long-time records, however, to find that any extremely wet or otherwise abnormal season which may have occurred in recent years—be it in Britain, Canada or anywhere else—was undoubtedly matched at some time in the past when, perhaps, there was some other scapegoat than "atomic blasts." In other words, while attempting explanations of "off seasons" change with the times, weather behavior is much the same from one generation to another.

Modern Science Tackles the Problem

Modern scientific attempts to increase rainfall started about 28 years ago, most of the so-called "landmark" experiments not having been conducted until after World War I. In Holland, during the summer of 1930, August W. Veraart directed four scientific experiments in cloud seeding. As a seeding agent, he used dry ice alone and in mixtures with super-cooled water ice. The results of the experiments were presented in several articles written and published in Holland, but his claims were viewed with scorn and disbelief by a number of his contemporaries. Although he actually had only a sketchy understanding of the cloud physics involved, he undoubtedly came closer to modern techniques of cloud seeding than anyone else prior to the General Electric experiments of 1946.

The real groundwork for modern experiments in weather modification was laid in 1933 when the famous

Swedish meteorologist, Tor Bergeron, advanced the theory that rain in appreciable amounts could be released principally by the presence of ice crystals formed in, or transported through, a water cloud. Five years later the German physicist, Walter Findeisen, re-emphasized that the co-existence of ice crystals and super-cooled water droplets in the proper proportion is a necessary condition for precipitation from a cloud and stressed the importance of the process of sublimation, thus establishing what came to be known as "The Bergeron-Findeisen theory."

Stage Prepared for Present Day Techniques

In 1940 the Chemical Warfare Board unknowingly set the stage for the development of modern weather modification. Two scientists who were asked to perform research on the nature of filtration in gas masks became interested in aircraft icing and its relation to the growth of cloud particles, on one occasion, when their research took them to Mount Washington in New Hampshire.

The problem of explaining why snow fell from some super-cooled stratus clouds and not from others so intrigued these scientists that they decided to make some laboratory experiments. In 1946, using an ordinary home freezer, Dr. Schaefer, one of the two, accidentally discovered that dry ice caused the formation of ice crystals in miniature super-cooled clouds, and he thereby triggered the precipitation process. This discovery was immediately seized upon to design some experiments with natural cloud in the atmosphere. Later the same year, a co-worker, Dr. B. Vonnegut, made the important discovery that microscopic silver-iodide crystals proved more efficient as freezing nuclei than those ordinarily found in the atmosphere.

There followed a series of large U.S. government organized projects to investigate problems related to cloud and weather modification. These included "Project Cirrus" conducted for the government by General Electric and a number of other projects which resulted in numerous field experiments. This, then, was roughly the situation as it existed some twelve years ago when real progress began to be made and when important developments started to take place in this field.

Cloud Identification Described

Before attempting to give some of the findings with respect to cloud seeding operations carried out in Canada and the U.S. during the past 10 or 12 years, some general observations should, perhaps, be made about the basic principles involved in cloud seeding and about the various methods employed to evaluate results.

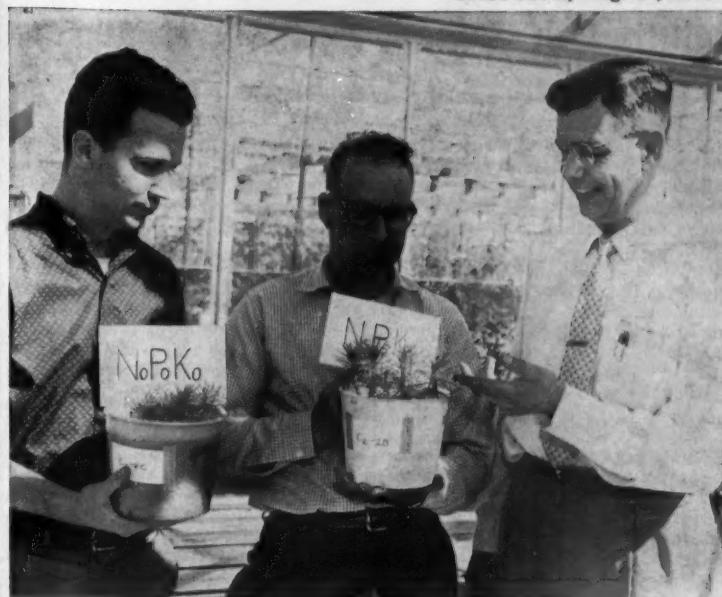
In order to appreciate the possible effects which cloud seeding may have, we must first have a clear picture of the way in which natural precipitation is produced, whether it be drizzle rain, snow or hail and just how the mechanisms may be influenced artificially. Because this, in itself, is a very large subject, mention can only be made here of some of the more important facts as well as some of the specific types of clouds and their apparent potentialities from a rain-making standpoint.

Clouds are composed of tiny droplets of water and, in some conditions, small ice crystals. The droplets, which are only about one thousandth of an inch in diameter, are so small that the space between them is large compared to their size. Raindrops are very much larger and relatively few in number. A single raindrop is made from over a million droplets.

Process of Change Becomes Important

Since the tiny droplets must be combined to form large drops before rain will fall, the process by which

(Turn to WEATHER, page 20)



DR. HORACE CHENEY, right, head of the soils department of Oregon State College, discusses the effect of fertilizers on the growth of Ponderosa pine with Dr. Chet Youngberg, professor of forest soils, center, and Ted Dyrness, graduate student. The poor growing pine seedlings on the left were unfertilized as compared to the excellent growth made by the fertilized seedlings on the right. The subject of proper management of Ponderosa pine will be one of the subjects discussed at the second annual Agro-Forestry meeting to be held Sept. 29 and 30 at the Pringle Falls Experimental Forest, 30 miles south and west of Bend, Oregon. The meeting will be sponsored by Oregon State College and the National Plant Food Institute.

USDA Reports Effectiveness of Organic Phosphorus Insecticide on Horse Botfly

WASHINGTON—An organic phosphorus insecticide has demonstrated effectiveness in experiments to control two species of botflies commonly parasitizing horses in the U.S., the U.S. Department of Agriculture reports.

The insecticide is Dipterex—chemically 0,0-dimethyl 2,2,2-trichloro-1-hydroxyethylphosphonate. Because tests are still in the experimental stage, use of Dipterex to control botflies of horses is not recommended at this time.

Scientists of USDA's Agricultural Research Service at Kerrville, Texas, found that Dipterex, added to feeds in dosages of from 37.5 to 40 milligrams per kilogram of animal weight (a milligram is one-millionth of a kilogram), was practically 100% effective in expelling botfly larvae in all growth stages from the bodies of horses.

Dipterex applied by stomach tube or intermuscular injections, and other insecticides tested failed to give comparable control of the pests.

Both species of flies—the throat botfly (*Gasterophilus nasalis*) and the common or horse botfly (*Gasterophilus intestinalis*)—showed equal susceptibility to Dipterex. A third species of bot common to horses, the nose botfly, does not occur normally in Texas.

Botfly larvae hatched from eggs deposited by adult flies on body hair enter the animal's body through the mouth, become attached to and feed on stomach and intestine walls, and when mature (10-11 months after hatching) are expelled by the host animal. Botfly larvae can cause extensive damage to internal tissues of horses. In addition, the attack of egg-laying adult flies makes horses nervous, and may result in the animals injuring themselves or humans.

Present treatment for botflies consists of (1) washing infested animals with warm water to stimulate premature hatching of larvae of the common botfly and (2) applying carbon disulfide directly into the stomach a month later to destroy larvae already attached to stomach and intestine walls.

In the Kerrville experiments, Dipterex in feeds demonstrated control of both the throat and common bot larvae at dosages of from 25 up to 75 milligrams per kilogram of animal

weight. However, above the 75-milligram level, Dipterex showed some toxicity and dosages below 25 milligrams gave inadequate control. Test animals showed reluctance to eat feeds containing dosages greater than 50 milligrams.

Oregon Grain Damaged By Virus Infestation

OREGON CITY, ORE.—Grain surpluses are unlikely in Clackamas County, Ore., this year due to serious infestation of yellow virus, reports J. J. Inskeep, county agent.

Loss in spring seeded oats and barley fields runs from 50% to total, Mr. Inskeep said. Some loss will be recorded in fall planted wheat and oats, but the virus apparently was not so potent in these plantings, Mr. Inskeep reports.

The virus first appeared five years ago in California and has spread as far east as Kansas, where losses will run from 25 to 30% in infested grain fields.

Plant pathologists and other field crop experts are hard at work trying to develop grain varieties that will be resistant to the virus, reports Mr. Inskeep.

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Potash Deliveries in First Six Months of 1959 Reported 8% Over Same Period of '58

WASHINGTON—Deliveries of potash for agricultural purposes in the United States, Canada, Cuba, Puerto Rico, and Hawaii totaled 2,110,722 tons of salts containing an equivalent of 1,237,370 tons K₂O during the first six months of 1959, according to the American Potash Institute. This was an increase of 8% in salts and K₂O over the same period in 1958.

Continental United States took 1,159,692 tons K₂O, Canada, 44,119 tons, Cuba, 3,359 tons, Puerto Rico, 16,795 tons, and Hawaii, 13,405 tons K₂O. These figures include imports of 112,339 tons K₂O for the first six months of the year, an increase of more than 15% over last year, API said.

Exports to other countries were 119,994 tons K₂O, an increase of 7%. Deliveries of potash for non-agricultural purposes amounted to 75,128 tons K₂O, an increase of 43% over last year. Total deliveries for all purposes were 2,432,678 tons of salts containing an equivalent of 1,432,492 tons K₂O, an increase of nearly 10% in salts and K₂O.

During the second quarter of 1959,

LAND

(Continued from page 1)

The study revealed an increase in the average size of ownership units (defined as single owners, husband and wife, partnership, estate, institution, or corporation) from 570 acres in 1945 to 643 acres in 1958, with no significant change in the total area of agricultural land. The 1958 total of ownership units was estimated to be 830,000, with at least 1.4 million persons having some direct ownership interest in the rural land of the 10 states covered.

The states are North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Texas, Montana, Wyoming, Colorado, and New Mexico. The 708 million acres of land in them is 37% of the total area and 47% of the farm and ranch land area of the United States. About 550 million of the 708 million acres are devoted to agricultural uses.

Proportions of rural land in public and private ownership vary considerably in the 10 states, the study showed. In New Mexico 41% is privately owned, and in Kansas 99% is privately owned, with the average for the 10 states totaling 75%.

Much of the rural land unsuitable for agriculture is held by federal, state, and local governments. Except for publicly owned grazing land, virtually all farm and ranch land is held by private owners.

The survey indicated that ownership of the privately held land is widely distributed. Fewer than 1% of the owners of farm and ranch land in the 10 states are corporations, although the corporations own a total of 8% of the privately held land. Much of this corporation land is low in productivity—like grazing lands.

Individuals, as distinct from corporations, own 89% of the grazing land and 96% of the cropland in the 10 states. Because ownership of the more productive land rests largely with individuals, the corporations own slightly more than 2% of the land measured in terms of its value.

Husband and wife combinations are the most common type of owner, the study showed. They own jointly or separately 49% of the farm and ranch land. Partnerships other than husband and wife control another 20%, and single men and women own another 17%.

A 31-page report has been issued on the survey titled "Land Ownership in the Great Plains—a Preliminary Report," ARS 43-93. A free copy may be obtained from the Agricultural Research Service, U.S. Department of Agriculture, Washington 25.

deliveries for agricultural purposes were 664,208 tons K₂O in Continental United States, 22,687 tons in Canada, 2,865 tons in Cuba, 15,295 tons in Puerto Rico, and 8,776 tons in Hawaii making a total of 713,831 tons K₂O, an increase of more than 19% over last year. Included in these figures are imports of 112,330 tons K₂O for the first six months of the year. Exports of potash to other countries during the second quarter were 60,556 tons K₂O, a decrease of about 1% under last year.

Deliveries of potash for non-agricultural purposes were 39,012 tons K₂O, an increase of nearly 58%. Total deliveries for the quarter including imports for the first six months, were 1,376,748 tons of salts containing an equivalent of 813,399 tons K₂O, an increase of more than 18% in salts and 19% in K₂O over last year.

Agronomists Cite Progress Made in Fertility Program

ATHENS, GA.—Progress continues to be the by-word in Georgia's soil fertility program, operating in 31 counties, according to J. R. Johnson, R. L. Wehnt, and P. J. Bergeaux, agronomists of the University of Georgia Agricultural Extension Service.

The program was started in 1957 by the extension service on an intensified basis. Six south central Georgia counties began the program as a "pilot" project. Twenty-six more counties were added to these pilot counties in 1958. An additional 20 counties will initiate the program this coming fall.

Charles R. O'Kelley, state agricultural leader for extension says, "The program is playing a major role toward improving the total economy of the state—farm, business, and industry."

Georgia farmers have enthusiastically accepted the program. It has also attracted attention throughout the U.S. Intensified soil fertility programs are now being conducted in 88 counties in 14 states. Projects in other states are largely patterned after Georgia's program with assistance from the National Plant Food Institute and American Potash Institute.

The program in Georgia has had a marked influence on more efficient fertilizer usage. Dr. Wehnt says, "Farmers are using fewer tons of low-analysis fertilizer each year because it pays them to buy high-analysis fertilizers."

For example, Georgia farmers used 389,660 tons of low-analysis fertilizers, such as 4-8-8, 4-8-6, and 6-8-6 in 1956. But in 1958, only 188,111 tons were used—a decrease of 52%. A good example is 4-8-6 fertilizer. About 144,373 tons were used in 1956 but only 49,813 tons of 4-8-6 were purchased in 1958. This decreased use of low-analysis fertilizers saved Georgia farmers an estimated \$1,500,000 in 1958.

A high-analysis fertilizer that continues to be popular with farmers is 4-12-12. Only 369,122 tons were used in 1955, but in 1958 about 642,585 tons were added to Georgia soils.

Another high-analysis fertilizer that is rapidly gaining favor with farmers is 5-10-15. This fertilizer is recommended for soils low in potash. Consumption of this fertilizer increased from only 2,892 tons in 1956 to 58,581 tons in 1958—a 20-fold gain. High potash fertilizers for tobacco, such as 3-9-13, are also being used by more farmers.

Mr. Johnson, who heads up the program as extension agronomy project leader, said the success of the program is due largely to the outstanding work of county agricultural agents.

PESTICIDES

(Continued from page 1)

duction of pesticides and other organic agricultural chemicals in 1958 amounted to 539 million pounds—about 5% more than the 512 million pounds reported for 1957. Sales in 1958 were 467 million pounds, valued at \$196 million, compared with 433 million pounds, valued at \$178 million, in 1957.

The output of cyclic pesticides and other chemicals included in the cyclic group amounted to 445 million pounds in 1958—about 9% more than the 407 million pounds produced in 1957. Sales in 1958 were 378 million pounds, valued at \$148 million, compared with 340 million pounds, valued at \$132 million, in 1957.

The chemical in this group which was produced in the greatest quantity in 1958 was DDT. The output of this product in 1958 amounted to 145 million pounds, a record high.

Production of acyclic pesticides and other acyclic organic agricultural chemicals in 1958 amounted to 95 million pounds, compared with the 104 million pounds reported for 1957; sales in 1958 were 89 million pounds, valued at \$48 million, compared with 94 million pounds, valued at \$46 million, in 1957.

The statistics on production and sales in the commission's preliminary report on pesticides and other organic agricultural chemicals are virtually complete. Complete statistics will be given in the commission's final report on production and sales of synthetic organic chemicals in 1958, which will be issued later this year.

R. T. Gravitt Moved To New Agrico Post

NEW YORK—R. T. Gravitt, former assistant sales manager at Agrico's Cincinnati office, has been transferred to London, Ky., in the same capacity, according to W. J. Turbeville, Jr., vice president in charge of fertilizer sales for the American Agricultural Chemical Co.

Systemic Miticide Injected in Soil Kills Mites on Mature Apple Trees, USDA Says

WASHINGTON—Recent experiments show that mites on mature apple trees can be controlled by injecting systemic miticides into soil under the trees with a device designed by a U.S. Department of Agriculture entomologist.

Field trials conducted in two Indiana orchards by Merrill L. Cleveland of USDA's agricultural research service, in cooperation with Purdue University, showed that soil injection of Thimet, an organic phosphorus compound, reduced mite populations.

In both orchards, however, the product applied to the trees as a spray was somewhat more effective than when injected into the soil. No harmful effects were noted on any of the trees receiving the injection treatment, USDA reports.

Since no device was available to test the soil-injection method, Mr. Cleveland developed an injector that operates from a conventional high-pressure orchard sprayer by attachment to the spray hose in the same manner as a spray gun.

The injector consists of a 4-foot piece of $\frac{1}{4}$ -inch pipe into which is placed a 4-foot section of $\frac{1}{4}$ -inch pipe. The two pipes are welded together, closed at one end, and that end shaped into a point through which a small hole is drilled to the inner pipe. Water forced through this hole allows the injector to move into the ground with little effort.

The outer pipe has several holes near the point through which the miticide solution is forced once the injector has been inserted about 3 feet

Despite Insects, Mid-South Farmers See Big Harvest

MEMPHIS—Mid-South farmers are looking forward to harvesting one of the best crops in recent years, according to various sources in Arkansas, Mississippi, Missouri and Tennessee.

The outlook in Arkansas is indicated by a report from George Baskins, manager of the employment security division office at Forrest City, Arkansas. "We have the greatest demand for agricultural workers that we have had in several years, and crops thus far this season are far better than those of the past several years," Mr. Baskins stated. He indicated cotton picking would be in full swing from about Sept. 7 and will continue through October.

Entomologists in Arkansas reported that second and third generation boll weevil emergence is general and that there still is a lot of field-to-field variation in insect infestations. Aphids were said to be building up in some fields, and spider mites were present in a large number of fields. Boll weevil infestation counts in Southwest Arkansas were reported to range from five to 95% during the middle of August. The entomologists pointed out that "65% of boll weevil feeding punctures bloom and set bolls, and also that a cotton plant can maintain an average 40% infestation throughout the season without decreasing yield."

Mississippi farmers have high hopes that this will continue to be one of the best crop years, the extension service reports. A build-up of boll weevils in some areas has kept farmers busy treating, but cotton insect pests were well under control in other areas. Cotton in southern counties is beginning to open and some bales have been ginned.

A big crop also is indicated in Missouri. Most West Tennessee crops, especially corn and soybeans, need rain.

Insect Control Efforts Pay Off in Colorado

FT. COLLINS, COLO.—Farmers who took steps to fight injurious insect pests are credited as being the main reason for the state's relatively mild agricultural insect problems this season. Dr. Leslie B. Daniels, head of the Colorado insect detection committee and Colorado State University experiment station entomologist, says that the insect pest problem this year has not been as serious as formerly.

"The use of recommended insecticides and better timing of their use are definitely reducing insect problems this year. There are a few local problems, but most of them can be pinned to failure to control the pests properly," he said.

SALESMAN DIES

PRENTISS, MISS.—Robert H. Moore, 44, sales representative for Merck & Co. chemical division since 1947, died suddenly at his home in Gerner, N.C., recently.

**SPECIAL
MERCHANDISING
SECTION**

BETTER SELLING

**MARKETING
NEWS AND
FEATURES**

Special Promotion 'Fertilizer Week' Yields Big Profits

Giant Ivy Display Adds Vigor to Dealer's Plan

By RUEL McDANIEL
CropLife Special Writer

Beeville Feed & Seed Co., Beeville, Texas, was doing a satisfactory job of selling fertilizers to farmers and ranchers, but Paul Russell, the owner, felt that the store was missing quite a lot of fertilizer profit from small-lot orders by failure to make a more obvious appeal to the small-lot purchaser.

Deciding to do something special for the small farmer and gardener who needs fertilizer and, in some cases, may develop into a volume buyer, Mr. Russell put on a special promotion last fall, built around "Fertilizer Week."

The promotion not only did everything expected of it, but considerably more. A major object of the event was to bring more small farmers, gardeners and housewives into the store. It brought in so many that the special stock of yard and garden fertilizers laid in to sell during "Fertilizer Week."

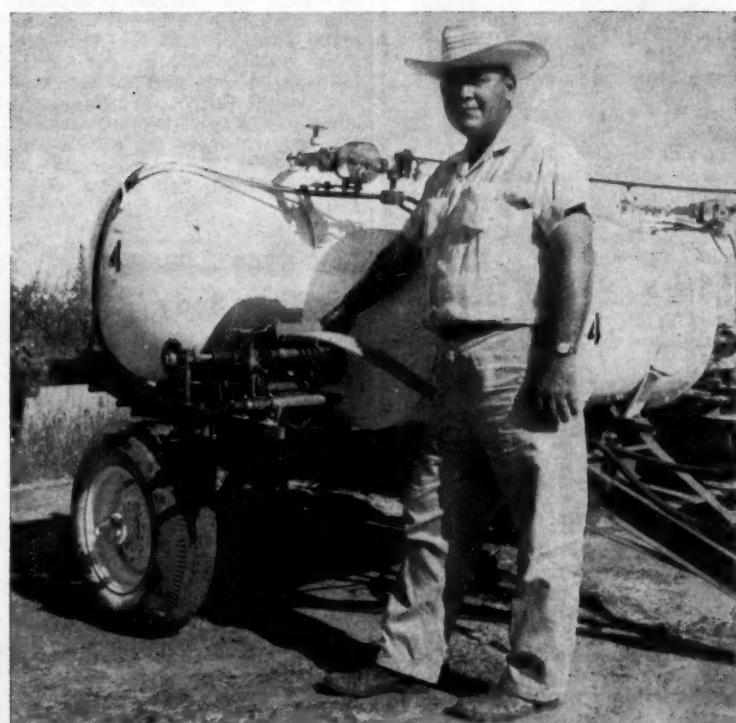
(Turn to 'FERTILIZER WEEK,' page 13)



THIS FLOOR DISPLAY, with a giant ivy in the center, was the feature attraction during the Beeville Feed & Seed Co. "Fertilizer Week" sale. The firm's supply of fertilizer was completely sold out.

Texas Chemical Firm Builds Fertilizer Business Through Use of Applicators, Storage Tank Service

★ ★ ★



JOHN RABB, manager of Red Barn Chemicals, Lamesa, Texas, points to a regulatory sprocket on a fertilizer applicator. By changing sprockets, the amount and proportion of nitrogen and phosphorus can be easily controlled.

By JESS BLAIR
CropLife Special Writer

Red Barn Chemicals of Lamesa, Texas, gives farmers two services with each gallon or pound of fertilizer sold. This includes a field demonstration on how to use the materials and also the applicators and storage tanks which the grower can use.

John Rabb, store manager, says this is the method used successfully by Red Barn Chemicals in other areas. The main plant is at Shreveport, La., but it has branch stores in several areas.

"We know that just selling fertilizer is not enough," said Mr. Rabb. "Farmers need advice on what to use and how to apply it. They also like to borrow or rent applicators—at least some of them do, because this is cheaper than buying their own equipment."

At the Lamesa plant Red Barn has 10 large pull-type applicators which can be pulled by the farmer's tractor. Each applicator is equipped with a 250 gal. tank for anhydrous ammonia and a 110-gal. tank for phosphoric acid.

"To save separate application, we put both tanks on the same rig," said Mr. Rabb. "We have a squeeze type pump with sprockets and chain to regulate the flow of materials. By changing to a different-sized sprocket, we can put out any amount of the two materials or in any proportion."

Farmers using the applicators may

also use the mobile storage tanks if they need them. Red Barn has about a dozen of these tanks mounted on wheels, and they can be pulled behind the farmer's car or pick-up.

"You'll notice these tanks are much higher off the ground than ordinary tanks," said Mr. Rabb. "We formerly had trouble getting the materials from the tank into applicators. It required pumping each time. Finally Mr. Nelson Abell, our company vice president at Shreveport, got the idea of elevating these tanks so the fertilizer would have a gravity flow into the applicator tanks. It worked quite well on the first one tried, so then the company started elevating all of them."

Another shop-made applicator devised by the company is for poisoning Johnson grass, which is a field pest in the South. This applicator consists of two 55-gal. barrels mounted on a two-wheel chassis. It has a one-cylinder gasoline motor for operating the pump. There is also a long hose with a regulating head so the flow can be regulated, both in quantity applied and in the amount of spray needed.

This applicator is used mostly for spot spraying, such as along turn rows or borders, or where the farmer has spotted stands of grass in a field. One man drives the tractor slowly while another walks behind and handles the hose. If only small

(Turn to TEXAS FIRM, page 14)

WHAT'S NEW

IN PRODUCTS • SERVICES • LITERATURE



No. 6949—Helicopter Spraying Booklet

Information about spraying, dusting and fogging by helicopter is discussed in a booklet recently released by Hiller Aircraft Corp. Photographs of the Hiller 12 E helicopters at work in the field, brief performance specifications and information on charter operator services are also presented. Copies of the booklet, called "New Workhorse for Forest, Farm and Ranch," can be obtained by checking No. 6949 on the coupon and mailing.

No. 6947—Handle Bag

Designed to lessen the load of carrying bulk packaged products in 25 lb., 40 lb., and 50 lb. multiwalls, the Hudson Pulp & Paper Corp. is pro-



ducing bags with side carrying handles. The construction of the handles provides for a pull of up to 250 lb., the company said. According to company literature, the handle bag was developed primarily because of the sharp rise in retail bulk packaging to increase saleability of the product and to lessen the handling cost to retailers. The handle feature encourages customers to carry home one or more packages. For details about the product check No. 6947 on the coupon and mail to this publication.

No. 6946—Liquid Grain Fumigant

Frontier Chemical Co., division of Vulcan Materials Co., announced the development of a liquid grain fumigant under the trademark "Chlorofume." The product, which gets its name from its chief ingredient, chloroform, is the result of four years of research and testing, the company said. Company literature listed the following advantages: High insect toxicity; greater grain penetrating power; savings of 20-30% per bushel of protected grain; safe handling, and no health hazard to human life when used with reasonable care. It is composed of three 100% active ingredients—chloroform, carbon bisulfide and ethylene dibromide. For further information about the product, check No. 6946 on the coupon and drop in the mailbox.

No. 6948—Broadcasting Unit

Larson Machine Co. announces a "Broad-Caster" for broadcasting pellet type fertilizer or small grains. A feature of the machine, according to the company, is a specially designed feed opening slide connection that



eliminates the need of disconnecting control parts when removing units. Opening, closing and adjusting are handled from one control within reach of the tractor seat. The feed slide control arms provide for adjustment on either side separately. A "Jabitor" agitator has been designed to reduce speed of motion so the fan shaft can be used for agitation to maintain a constant flow without causing violent churning of material. For more complete information about the product check No. 6948 on the coupon and mail.

ture is also of advantage when spraying near fence rows or buildings. The unit is easily mounted on a tractor, with the control handle positioned convenient to the operator, company literature explained. Five different capacity ranges are available. The DirectoJet may be removed and used as an auxiliary spray gun. Check No. 6940 for details.

No. 6939—Display Units

Salesroom wall type merchandisers and gondolas have been announced by Shure Manufacturing Corp. Heavy-duty steel uprights and brackets, available in a number of sizes, are quickly adjustable to meet seasonal requirements, the company said. Wall displays can include lettered plastic valances and large perforated display panels which accommodate numerous combinations of displays. Planning and layout service is available from Shure Manufacturing Corp. to assist in the best utilization of available space. For details check No. 6939 on the coupon and mail.

Also Available

The following items have appeared in previous issues of Croplife. They are reprinted to help keep dealers on the regional circulation plan informed of "What's New."

No. 6943—Weed Killer Literature

Reasor-Hill Corp. has announced the availability of literature on the firm's granular weed killer, R-H Weed Rhab-20. The literature answers many questions, the company says, frequently asked about the product including what weeds it can kill, how to use and costs. A special portion on weeds in corn is contained. For copies of the literature, check No. 6943 on the coupon and mail.

No. 6944—Auto Leasing Study

A study for executives and financial officers, recently published by the Foundation for Management Research, analyzes the advantages and disadvantages of leasing auto fleets for company salesmen in cities and over-the-road. The 24-page study includes full charts on costs involved in different fleet plans, and is based on records covering 29,264 autos. The report is titled "Advantages and Disadvantages of Auto Fleet Leasing: A Comparison of Company Ownership, Salesman Ownership and Leasing." For copies, check No. 6944 on the coupon and mail.

No. 6940—Spray Nozzle, Control Valve

Spraying Systems Co. announces the DirectoJet, designed with a control valve that provides spray to either the left or right side of the tractor, or to both sides at one time as well as off-and-on control. The entire sequence of operations is controlled by the operator without leaving the tractor seat, the company said. Because the spray can be shut off to either right or left, the spray can be set in the down-wind direction on windy days. This control fea-

No. 6938—Fly Killer

Camp Chemical Co. announced a new Diazinon Fly Bait Killer. In powder form, the product attracts flies and kills them, the company said. It is especially designed for outdoor use. The company guarantees a 98% fly reduction each day of use. The package is ready for use merely by sprinkling on the ground or horizontal surfaces. The packages come 12 to the case. For information on this fly killer check No. 6938 on the coupon and mail to this publication.

No. 6945—Warehouse Layout Brochure

"Warehouse Layout: Narrow Aisles or Wide?" is the subject of an eight-page brochure published by the Automatic Transportation Co. This brochure is designed as a guide for the best type of warehouse for individual installations. Four pages of Automatic equipment in operation illustrate certain ways to solve the narrow-wide aisle problem. For copies of the brochure, check No. 6945 on the coupon and mail.

No. 6941—Feed, Fertilizer Body

A combination bulk feed and fertilizer body called the "Feedizer," has been introduced by Simonsen Manufacturing Co. The 3,800 lb., all-steel body can give the dealer an extra fertilizer spreader during the rush season and it also can allow the dealer to expand his operation from the relatively short fertilizer spreading season to a full 12 months by add-

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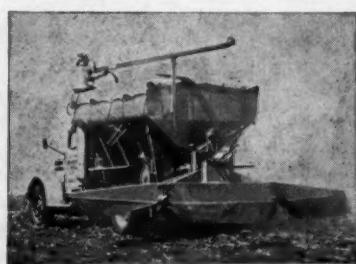
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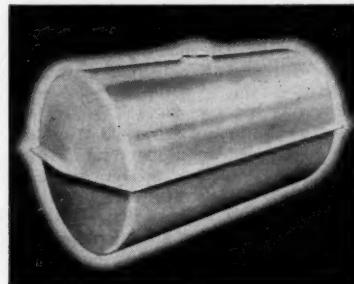
ing bulk feed delivery, the company said. The Feedizer is two complete bodies in one, with a total capacity of 261 cu. ft. The two compartments will hold 8½ tons of fertilizer or 5.2 tons of feed. This allows splitting a load into two separate orders of fertilizer at a time or separate feed orders. One compartment can be filled with fertilizer and the other with feed. The unit has all the features of a bulk feed body and a spreader. Its feed delivery auger will reach 21 ft. bins, will turn 360° and will deliver feed at the rate of 800 lb. a minute. The fertilizer spreader unit is designed to spread accurately down to 75 lb. an acre. Because its apron is run by a wheel drive, the truck can be operated in all gears or with a two-speed axle without affecting the rate of fertilizer spread. Stainless steel is used at all critical points to reduce corrosion. For more information, check No. 6941 on the coupon and mail.

No. 6942—Cotton Pest Control Leaflet

Recommended procedures for the control of cotton pests are outlined in a new leaflet published by Stauffer Chemical Co. The leaflet describes the formulations of Trithion available, dosage recommendations and application methods for the control of two spotted mite, cinnabar mite, tropical mite, cotton aphid, leafworm and leaf perforator. Copies are available without charge by checking No. 6942 on the coupon and mailing to this publication.

No. 6937—Molded Tank

A molded fiber glass tank for use in spraying or storing corrosive liquids has been announced by the Molded Fiber Glass Body Co. Designed in a cylindrical shape, the 200-gal. tank is said to resist corrosion and weathering. It is recommended for use as a spray tank for insecti-



cides and liquid fertilizers, or as a storage tank for chemicals. The tank is easy to clean, the company said, and is lightweight and impact resistant. It is 58 in. long with a 32 in. diameter. Available in a selection of colors, the tank is translucent so that the liquid is always visible. For more information check No. 6937 on the coupon and mail to this publication.

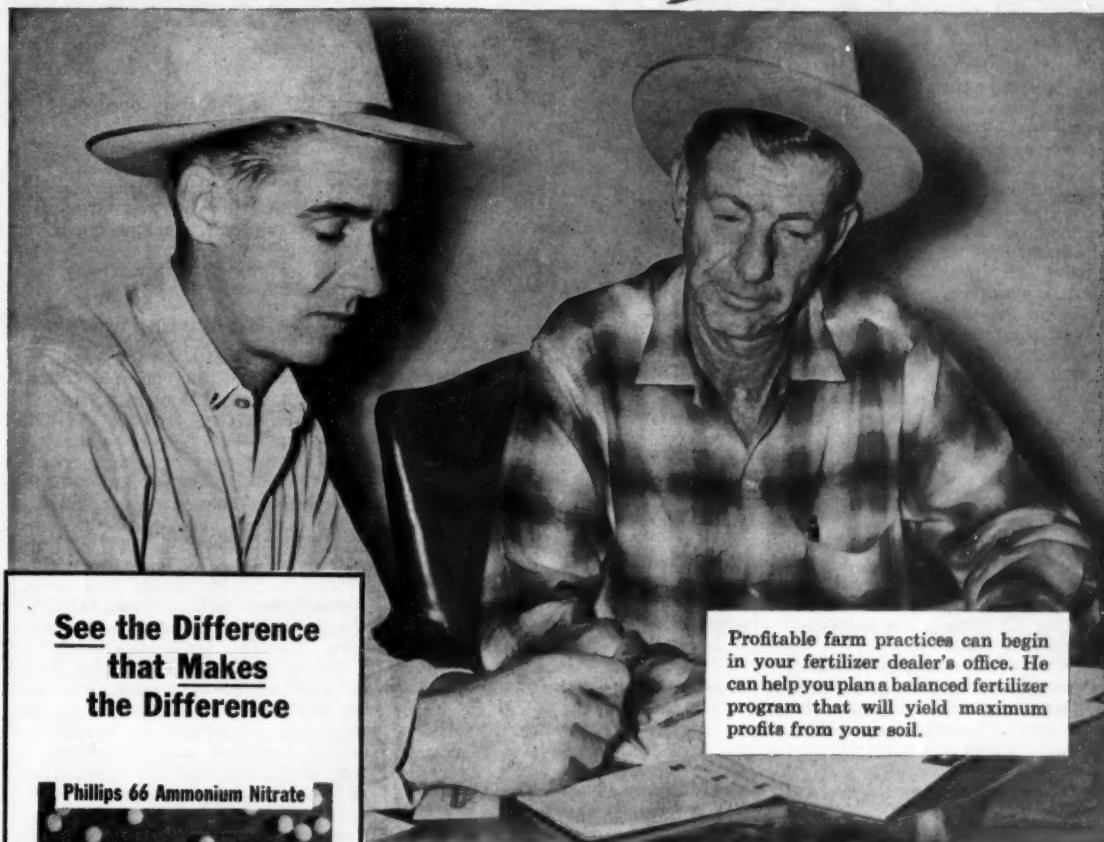
FOUR NEW STAFFERS

FAYETTEVILLE, ARK.—Appointment of four new staff members in the University of Arkansas' agronomy department was announced by Dr. John W. White, vice president for agriculture. They include: Dr. Ronald E. Phillips, who will carry on research and teaching duties in the field of soil physics, replacing Dr. C. L. Garey; David E. Womack, who will assist with breeding and management research on small grain crops, replacing J. W. Grimes who resigned last summer, and William T. Cole and Bobby R. Wells, graduate assistants.

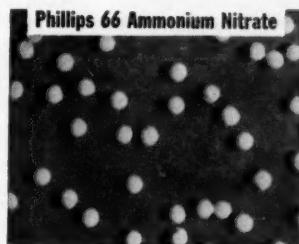
INSECT, PLANT DISEASE NOTES

See Page 4

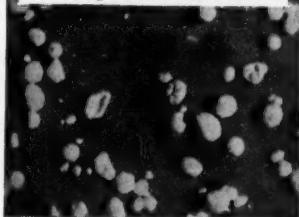
PHILLIPS 66 ads like this appear regularly in
CAPPER'S FARMER, PROGRESSIVE FARMER, FARM JOURNAL,
FARMER-STOCKMAN and FARM and RANCH . . . part of a
continuing program to help dealers sell more mixed fertilizers
and PHILLIPS 66 AMMONIUM NITRATE.



See the Difference that Makes the Difference



Ordinary Ammonium Nitrate



Both products shown 2 times actual size

Phillips new and different electronically-controlled process and polyethylene-lined bags insure that you get round, hard, dry and uniform prills that stay that way in storage and during application.

Profitable farm practices can begin in your fertilizer dealer's office. He can help you plan a balanced fertilizer program that will yield maximum profits from your soil.

Your fertilizer dealer, good source of crop profit information

Your Phillips 66 Ammonium Nitrate dealer can be your party line to increased crop profits. Why? Because he is in a position to know a great deal about the best local farming practices. Many times he knows about farmers who live miles from you who have had success with a new approach to fertilization that could also work for you.

Your fertilizer dealer works with your county agent, the soil conservation service and vo-ag

teachers to keep informed on new farming developments. And every day he meets many leading local farmers who tell him about their own practical experiences.

Talk to your Phillips 66 Ammonium Nitrate dealer today. Let him help you plan a balanced fertilizer program. He can show you how to increase yields and profits using his mixed grade fertilizers and the supplemental nitrogen available in high quality Phillips 66 Ammonium Nitrate.

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Business Ethics and Small Marketers

By WAYNE A. R. LEYS

Dean of the Graduate Division,
Roosevelt University, Chicago, Ill.

What constitutes ethics in business? Surely, this is no idle, academic question. Quite the contrary. Shady or "shadow" practices (in the former obviously un-ethical procedures; the latter commonly used and not so obviously un-ethical) are resorted to every day. Does that mean that businessmen are dishonest? Not at all. Only a few resort to shady practices. Shadow practices are other things altogether. But, in any case, business morality, like private morality, is often stretched . . . and sometimes it is stretched too far.

Twilight Zone of Business

Understandably, many businessmen with no thought to using dishonest methods, are grieved at the "low" standards among competitors. The other fellow (you can hear them exclaim) really should reform! But hold it: Is it always the other fellow? Yes, chances are you never use un-ethical practices, but what about your activities in the shadow area? What about, for example, the time you took that customer's buyer to the ballpark—you know, the one who gave you and not Frank Mason's wholesale house that big order? Everyday practice in business? Sure—but (strictly speaking) is it ethical?

Shadow Practices. There is no royal road to a single standard of business ethics that everyone will agree on. This particularly seems to be the case in this shadow area. For example, Ed Powers, a buyer well-known to "Good-Time Glenn" Brooks, the owner of a small wholesale house, likes good food and is crazy about the theater. In the past, Ed and Glenn have done a lot of business and, naturally, Glenn is appreciative. His gratitude now and then expresses itself in the form of theater tickets and fancy dishes in expensive restaurants for Ed Powers and his wife.

Ethical—or un-ethical?

A store owner over-sells his customers; upgrades or misrepresents his merchandise, makes slighting statements about his competitors and their wares.

Ethical—or un-ethical?

A salesman secures orders by promising kickbacks.

Ethical—or un-ethical?

Then, of course, there is that darling of fiction writers, the improvident nephew in need of a job. He gets it (in fact and fiction), at times at the expense of an old employee.

Ethical—or un-ethical?

Of course, you have come across some of these practices. You may have condemned them, but you know you can't shut your eyes to them. You know this, too: that some of them may give you, personally, and the business community in your town, a bad name. This is even more true of another type of business behavior with which you are familiar.

Shady Practices. John Myers runs a delicatessen. One day he gets an unexpected visit from a building inspector (he isn't due for another six months). The inspector looks around, frowns, mutters, sadly shakes his head; announces, finally, that the store's wiring system isn't working properly (it is) and the sprinkler is obsolete (it's practically new). When the door closes behind his visitor, John Myers' cash register is \$50 leaner, and the inspector's wallet has grown noticeably fatter.

Un-ethical? Of course. And dangerous: once a blackmail victim, always a blackmail victim. Thus John Myers will hear from his "friend" the inspector again. And (probably) again.

Wily Walt. When John passively gave in to pressure, Walt Framer actively works the shady side of the street. At one time or another, Wily

Walt has used a good many of the 800 schemes for cheating known to the Better Business Bureaus. Oh, yes, he's been caught once or twice; but that was in another town, and under another name.

Currently he is trying for the fast buck by using three stock tricks of business crooks: (1) Bait advertising, which promises a certain article at a bargain price; what Walt actually sells the un-wary is a similar product at a far-from-bargain price. (2) He lets it be known that his retail establishment sells goods at wholesale prices. (3) He sends merchandise to people who never asked for it. While part of that manna-from-Walt returns to the store, some of it is actually paid for by easy-to-sell ("We don't want any fuss") people. Such people elicit a resigned statement from the Better Business Bureaus.

"In every scheme," sadly comments the BBB officials, "there is both a perpetrator and a victim. Every consumer is a potential victim."

So, in a sense, are you and every other honest businessman. Wily Walt, even more than Good-Time Glenn, damages the reputation of operators of small businesses who refrain from using shady or even shadow practices. And, of course, the Wals and Glenns of commerce give unfair, unethical competition to the rest of the business community . . . at least, for a while.

Codes, Ethics and Ignorance

Again and again, the small marketer faces the problems created by unfair, un-ethical competition. Morally wrong and materially damaging to others, such competition is nothing new. Nor is the problem itself new. Actually, as long ago as First World War, manufacturers in one industry banded together to stop shady practices, including bribery, that seriously threatened the integrity of their trade. Other business groups followed their example.

Ivory Tower Morality. In no time, the number of codes soared. Unfortunately, some of them suffered from a perfectionism-on-paper, the result of which was a cynical indifference to their contents. Not all of them were like that, of course; and even those that were often served a useful purpose in that they established a goal—even if it were a distant goal. And they served a broader purpose, too: They brought together groups of businessmen, and such meetings often resulted in better mutual understanding and in opportunities to exchange views on business conduct and practices.

But codes will not work unless people make them work. High-flown language is no substitute for high-minded dealings. This is precisely the view of businessmen today who watch with apprehension the un-ethical practices of Wily Wals and Good-Time Glenns. Of course, these men are in the minority. In fact, bargain-basement inventor Edward Filene once stated that "there are few evil

minded, but quite a few absent-minded managers."

The Evil of Ignorance. Mr. Filene may have been thinking about the big canner whose product was found to be contaminated. Taken to court, he admitted that lack of technical knowledge of how to handle his merchandise was at the root of the trouble. Such an irresponsible, buyer-be-wary attitude is probably uncommon today in big business and small, but ignorance and/or indifference toward retail customers' requests is not. And, unfortunately, this attitude often creates in the customer a suspicion of evil intent, where none such exists.

Thus Toni Gail was certain she had been "taken" when she arrived home the other night only to find that the purchase she had made during her lunch hour was not at all what she had asked for. Actually, this is what happened. Because she was in a hurry she had neglected to inspect the merchandise closely, and the clerk mistakenly handed her the wrong kind. Her reaction? "They gypped me," she exclaimed.

Although she was obviously wrong, nonetheless her attitude points to a peril: If unfortunate accidents can play havoc with your reputation as a businessman, how much more can the presence in your community or town of Wily Wals wreak havoc with your reputation.

Men, Money and Morals

The reputation of your business depends not only on your own acts—and, of course, it does to a large degree—but also on the acts of others. Un-ethical practices (of the shady or shadow variety) may harm you and other honest business operators in the eyes of the community. A hundred years ago, it is true, businessmen were often less concerned with the impression they made on their competitors or on the public. And an unsophisticated public frequently fell for the tricks of unscrupulous operators.

Ethics, Then and Now. Thus, when in the last century consumers saw an ad reading "Hurry, hurry, a complete sewing machine for twenty-five cents," hundreds of them rushed to that store. The "bargain" turned out to be a needle-and-thread, a pretty expensive bargain for those days. Fantastic? Well, yes. But the sad fact is that the consumer's sophistication today is only skin deep, and shady operators still ply their trade in cities and towns alike, preying on the innocent.

Dobson's Dilemma. One such innocent was Henry Dobson who recently took his car to a garage for a check-up. "I don't think there's anything wrong," he told the mechanic-in-chief naively. "Once in a while, it won't start properly."

After spending less than sixty seconds peering under the hood, the mechanical mastermind delivered his grim verdict. "You need a new battery," he proclaimed in a superior tone of voice. Dobson, not knowing

more about cars than that they move if you press the accelerator, humbly assented. The new battery was shiny, and it looked just like the thing to make a sluggish car take heart.

But next morning, the sluggish car was still sluggish. It refused to move. By that evening, Dobson had it towed to another garage. There the mechanic, informed that a new battery had been put in the previous night, made his diagnosis without even so much as glancing at the patient's insides. "It's your generator. It don't function well. Take my word for it."

Dobson, of course, had to take his word for it. A new generator was added to the new battery. The new generator obviously performed the needed miracle: After the garage man had put it in and given the new battery a thirty-minute charge ("Sure, sure, I know it's new; but they sometimes act funny when they're new"), and charged extra for it, the car rolled merrily down the highway . . . all the way to Dobson's home. Dobson was delighted: His troubles were over.

Unfortunately, Dobson's troubles were not over. The following day the car started . . . in the morning. During his trip home in the evening, however, after stopping at one of the town's busiest intersections, the car refused to start. Luckily, there was a garage nearby. After (somewhat reluctantly) towing the car into it, the mechanic of garage No. 3, before even lifting the hood, informed Dobson that his battery was dead. "It's brand new," Dobson said uneasily. Mechanic of garage No. 3 threw him a withering look, but at least he did lift up the hood. A moment later he knew the answer. "It's your voltage regulator. It's gone." A new voltage regulator shortly joined a new battery and a new generator. Before leaving the garage, Dobson shyly begged an attendant to charge his battery. "Just in case," Dobson said apologetically. The battery got a 30-minute charge (at additional cost, of course).

Now did the car run? Yes, for a day or so. Then the same old trouble started. Finally, in desperation Dobson (a suburbanite) took the car into a downtown garage where one of the mechanics, Fred, was an honest man. After listening to his tale, Fred took a long, lingering look under the hood. When he emerged he gave Dobson a pitying glance. "All this heap needs is a two-or-three hour battery charge," he said.

Dobson was dumbfounded. "But it's a new battery," he exclaimed.

Fred shrugged his shoulders. "That's the way it is, Mr. Dobson," he explained patiently. "Maybe they gave you a perfectly new battery; then again maybe not. But even if they did, what happens is that sometimes when a battery sits around too long before it's installed in a car, it may lose its pep."

Well, Fred recharged the battery. The car is fine, thank you, but, of course, Dobson's wallet is somewhat sick.

Problems and Progress

Dobson's dilemma resulted from two factors: (a) He himself knew little about cars. (b) He had to rely on specialists. In today's complex society, few people could claim intimate knowledge of other men's jobs. Thus, in the age of the specialist, most consumers simply have to depend on specialists. This gives the un-ethical (as well as the lazy, indifferent or incompetent) seller of services a ready-made field.

Three to Watch. But, as you well know, tricksters do not rely on the confusion of our mechanized world alone to dupe the customer. You will recognize some of these men and methods:

Two-Price Joe: He has an over-the-

SUMMARY

"I haven't time to think about ethical standards," a small business proprietor exclaimed recently. "Look, all my waking hours are spent worrying about the shop and how to keep it going. I just haven't time for theory."

But, though many businessmen would agree with that man, a personal code of ethical conduct is a very practical thing. Without it, you and your business may be heading for trouble. That is no theory. Once you make concessions, you are headed for disaster. Disregard for the rules of ethics may land you in jail or ruin your reputation beyond the possibility of repair. And closing your eyes to other businessmen's unethical behavior will only result in giving you and other honest operators a black eye.

What follows is certainly not intended to be a sermon; neither is it intended to be a blueprint for your way of doing business. This Aid simply discusses the hard, cold facts of good business.

In these pages you'll encounter "shady practices" and "shadow practices," you'll meet Wily Walt and Good-Time Glenn, you'll come face to face with many kinds of men, methods and morals of commerce.

counter and an under-the-counter price, one for you and one for his friends. And sometimes he shaves the price if a customer threatens to "go to Al's across the street."

Come-On Harry: His stock in trade is the come-on item (a "terrific bargain") that usually exists only in his ad. If you really find it in the store, he'll do anything rather than sell it to you. He wants you to buy the most expensive thing in the shop.

Liquidation-Eddy: His show window has carried a sign reading "Going Out of Business—Sale" for so many years that it's become a fixture. He'll still be going out of business next year, and the year after that.

Quest for Ethics: As a scrupulous small marketer, you dislike such and similar methods. You also realize that the men using them give the entire business community a black eye; and there may be times when you get exasperated, and wonder what you can do? Of course there are several roads open to you:

Imitate Wily Walt: This solution you put aside instantly.

Go Out of Business: This solution is not much better. You like being your own boss.

Remain Honest: Well and good, but your reputation is suffering from identification with Walt, who operates next door. Your trade, too, may suffer—until consumers wake up.

Take Preventive Action: You can probably take Wily Walt to court, but you'd better be sure you have proof. Then, too, even if you win, court proceedings are expensive.

Take Positive Action: Join, or become more active in, a trade association, Chamber of Commerce, or service club. Help to write a new (or re-write an old) code of ethics.

Are Ethics Really Necessary? It's been said that three policemen guard our way of life: the law, competition, and ourselves (individually or as members of groups). That third policeman enforces business ethics. But are ethics necessary in business? This Aid certainly does not want to preach a sermon; but even from a practical point of view you, as a businessman, know that there are sound and practical reasons for an affirmative reply:

Community: In your community, you've been asked to assume leadership in social affairs, drives for charity, town-modernization activities. So: Can you afford to be un-ethical?

Customers: Your customers, and fellow townsmen, have put their trust in your reliability. They are your friends and neighbors. So: Can you afford to be un-ethical?

Credit: Many of your customers are able to buy your goods only because they can buy them on credit—and have faith in the credit system. Credit means trust; and trust is undermined by sharp practices. So: Can you afford to be un-ethical?

Competitor: Your competitor down the street also is a member of your social clubs, your church, your service organization. You want him to respect you. So: Can you afford to be un-ethical?

Free Enterprise: The free enterprise system has made it possible for you to go into the kind of business you like. Under that system, you've done pretty well. But what would happen if because of your own unethical practices and those of your competitors people lost confidence in the business community . . . and demanded more and more government control? You know the answer. So: Can you afford to be un-ethical?

Pride: Then there is the pride you take in being your own boss. If customers cease to trust you, how long will you remain in business? So: Can you afford to be un-ethical?

Prestige: Finally, you like the prestige of being a businessman, a community leader, a man who can make his own decisions. Prestige is precious . . . and fragile: A touch of scandal can shatter it in a moment. So: Can you afford to be un-ethical?

'FERTILIZER WEEK'

(Continued from page 9)

"Fertilizer Week" was completely sold out and it was necessary for the company to take numerous orders, to be delivered upon receipt of a rush shipment.

Center of attraction was a special display of small farm, garden and yard fertilizers and preventive chemicals on the sales floor. Center of the display was a mammoth ivy plant, which Mr. Russell had grown by utilization of the fertilizers featured. It was moved into the store in its original pot, and it was so large that the topmost vines almost touched the store ceiling.

"Everybody wanted to know who grew the giant ivy," Mr. Russell explains, "and when we told them, and that we used the plant foods featured to grow it, well they bought fertilizers."

The event was publicized in the local weekly paper and several spots during the days of the week's event provided liberal radio advertising. Some of the spots mentioned the giant ivy on display and invited people to come in and see it.

Several other smaller plants added a touch of extravagance to the display and helped to focus further attention upon it. Ample folders were available for visitors to take and read—folders that carried gardening tips as well as information on fertilizers, how and when to use them.

The company does an excellent farm and ranch fertilizer business, selling several truck-load orders each season for delivery directly to the customers, in addition to less-than-truckload business to farmers and ranchers.

"We like the small-order fertilizer business, though," Mr. Russell points out, "because it carries a better markup—and it brings more people into the store."

And, the management finds, small-order fertilizer customers sometimes develop into larger buyers. A farmer's wife, for example, visited the store during "Fertilizer Week," saw the giant ivy and other vigorous plants, bought a bag of the featured fertilizer, tried it and the results were so obvious that her husband

fertilized several acres of cotton, a thing that he had never done before.

A rancher bought a couple of bags of fertilizer for his wife's garden, saw the quick results and later bought enough fertilizer to run a test on his pasture land. It is possible that this initial garden order may lead to a truck-load business during the coming year.

The company marked the fertilizers on display to appeal to small order customers, and the price represented a modest discount from regular mark-up. After the stock purchased for the special event sold and customers continued to ask for fertilizers, the management began taking orders for future delivery, giving these later customers the privilege of paying for their orders upon arrival at the special "Fertilizer Week" prices.

MORE MOSQUITO FUNDS

VANCOUVER, WASH.—The Vancouver city council has granted an additional \$1,000 to the county for mosquito control. The city provides \$4,000 of the annual \$10,000 control program. Irving Jensen, mayor, said he felt the mosquito program was one which is little known to the public when it operates successfully.

Books on Soils and Soil Management

SOILS AND FERTILIZERS—Fourth Edition

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A complete study of soils: physical properties, soil, organic matter, relation of water, control of water, tillage, erosion, acidity and its control by liming, management of alkali soils, nitrogen and its importance to the farmer, production, conservation and utilization of farm manures, production and utilization of green manure crops; fertilizer materials and their effects on soils; crop rotations; fertilization and long-term maintenance of productivity of mineral soils. Published 1941. 424 pages, illustrated

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IRRIGATED SOILS: Their Fertility and Management—New 1954—Second Edition

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An outstanding text dealing with the problems of irrigated regions. In addition to the chapters dealing with irrigation, the salt problem, reclamation of saline and alkali soils, there are chapters on maintaining organic matter in soil, minerals and plant growth, fertilizer elements and fertilizer materials, using fertilizers, soil management for general field crops, for fruit, vegetable and specialty crops

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THE RESPONSE OF CROPS AND SOILS TO FERTILIZERS AND MANURES (1954)

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The theme of the book is the necessity of chemical fertilizers to maintain the fertility of the soil. It has concise information on which soil conditions and which chemical fertilizers are most suited for special crops and vegetables. Space is devoted to cereal crops, barley, wheat, oats and rye; to roots and tubers, sugar beets, potatoes, carrots, parsnips and turnips; to vegetable crops, beans, peas, alfalfa, lupines; to grasses and clovers; to onions, flax, kale, cabbages, lettuce, tomatoes, celery, cauliflower and fruits. It clarifies the relationship of manure, compost and chemicals as fertilizers and points out how chemicals should be used to obtain the best results. Its philosophical soundness and logic should do much to avert the confusion of thought introduced by the advocates of compost and manure as against the use of chemical fertilizers

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By AL P. NELSON
Croplife Special Writer

When Oscar came home that noon for lunch, Minnie, her black hair done in a knot at the back of her head, greeted him nervously and kept fidgeting with her hands. She said nothing, however, until Oscar had eaten his two liverwurst sandwiches and buttermilk.

As he finished, she said timidly,
"Oscar, we got a letter from Henrietta. She and Reinhold are coming on the bus Saturday. They want to stay until Sunday night."

Oscar frowned. "Oh, that windbag!" he said. "Ach, he is always bragging about how much he saves. One could almost think he figures he saves more than I do."

"I could make a meat loaf to last for two days," Minnie suggested fearfully. "It would not cost so much."

"Ach, I wish we could give him only bones and pea soup," Oscar said. "Even if he is your sister's husband, I don't like him. He won't eat for three days before he comes. Ach, he wants to fill up here. Don't make any cakes or pies when he is here. He'll ask for two pieces at one meal, like he did last time."

Reinhold was unlike Oscar in one respect. He liked to tell jokes and laugh. He was like Oscar, though, in that he was tight, had a pot and was forever thinking of ways to save money.

"Well, Oscar," he said as he and buxom Henrietta stepped into the house that summer night, with Reinhold holding a 20-year-old valise, "how much are you paying for eggs?"

"Twenty two cents a dozen," Oscar replied, thinking it a low price.

"Oh, we get them for twenty one cents in our town," Reinhold replied. "But sometimes my grocer gives me cracked eggs for nineteen cents a dozen. He saves them for me."

And so it went. At supper table, Reinhold said, "Oscar, how much do you pay for oleo?"

"Ach, we get it for 45¢ at the cut rate super market."

Reinhold shook his head. "Too much, too much, Oscar. I had a trucker bring it to me from Illinois when he comes back to Iowa. I pay him 30 cents a pound."

Oscar felt himself squirming. He was not used to having someone get better bargains than he.

"Ach, I haven't bought a new suit in eight years, Oscar. I am chairman of the church old clothes drive for Africans." He smiled slyly. "They bring the clothes to our house and

FLORIDA AG LEADER DIES

GAINESVILLE, FLA.—Arthur P. Spencer, former director of the University of Florida agricultural extension service and long-time Florida agricultural leader, died here July 27, following a brief illness. Mr. Spencer, who was 82, was a native of Canada and graduate of Virginia Polytechnic Institute. He first joined the University of Florida staff in 1910, as assistant in extension, and was the first person in Florida to hold a title in agricultural extension work. Mr. Spencer was named district agent with the Extension Service in 1914. He helped set up the system of county and home demonstration agents that is now widely known throughout Florida.

OSCAR & PAT

Henrietta and I sort them out. I pick out the best suits for myself and give them my old worn out suits. I make some mighty good trade.

"And I get some nice dresses too," Henrietta piped up proudly. "Of course we deserve the clothes. We do a lot of sorting and cleaning for nothing. But once in a while I catch a woman looking at my dress at the Ladies' Aid or in church, but it doesn't bother me."

Reinhold smiled. "The newsboy on our route has over 75 heavy papers a day, Oscar. I told him he could put half of them on my screened porch—then he wouldn't have to carry so many on half his route. I hurry and read the paper before he gets back. I save 5¢ a day. Do you still go to the hotel after work and get a copy of the morning newspaper from the lobby, Oscar?"

Oscar nodded.

"Yah, that's a good idea, too." Reinhold commented. "Ach, the country don't have many savers like you and me anymore." He patted his pot belly. "And I get my beer free, too."

"I don't drink beer," Oscar said. "It makes me belch too much."

"Ah, Hampton lager is good. It doesn't make me belch," Reinhold said. "Heinrich Hampton knows his stuff. He lets anybody in town come from 4 p.m. to 6 p.m. and get free beer in the brewery taproom. It builds business for his beer, he says. People get used to drinkin' Hampton beer and then they ask for it in taverns."

Oscar frowned and said nothing.

"But I don't drink any beer I pay for," Reinhold said. "I only take three to four steins and then I quit. You know, you have to be able to walk out of the brewery taproom under your own power. Otherwise they won't let you come in again."

Oscar's eye traveled over the red, flowered rug on the floor, and his eyes lighted. "Ach, have you tried buying second hand rugs, Reinhold?" he said. "This is one."

Reinhold looked down at the rug. "Yah, it looks nice—only a couple of worn spots."

Oscar nodded. "Ach, who sees them? I go to a Milwaukee hotel

chain. They have a rug repair shop. All their rugs from eight hotels come in there to be repaired. Some can't be repaired. So they sell them. Adolph Schwalke—I know him from synod meetings—he works there. He lets me know what rugs they will sell cheap. I got this one for \$7."

"Seven dollars!"

"Sure. I had to haul it one Sunday morning with the pickup truck. Then I spread it on the grass and scrubbed it. Oh, on rainy days it smells a little of cigar smoke. You can't get all the smell out. But it is chaste as a new rug—for our purpose."

"Yah, yah," said Reinhold. "I wish I had a connection like that. I could save more then."

"If you had a spendthrift partner in business like I got," Oscar growled, "you would try to think of new ways to save day and night, to stay ahead. I have a good one now. A brakeman I know throws off all the old boxcar lumber and stakes that they use in railroad cars to hold merchandise in place. Then I go down to the tracks by the store Sunday afternoon and pull out all the nails. I sell the lumber to farmers who want to build sheds, and they buy the straightened nails, too. Some are shinny—like new."

Reinhold gasped. "You sell old lumber and straightened nails? Oscar, that gives me an idea. I never thought of that."

By the time Reinhold and Henrietta left for home Sunday afternoon, Reinhold and Oscar figured they had rated a draw on the savings program. Neither said anything to the other about it, but each was a little pleased he had not pulled far ahead of the other in the race.

Later, when Oscar and Minnie were alone, Oscar said, "Now that Reinhold is gone, bring up some dandelion wine, Minnie, and let us have a little sip. Ach, that Reinhold is a tight one. I would not like to be as tight as that."

TEXAS FIRM

(Continued from page 9)

spots are treated, one man may handle it by stopping the tractor and doing the spraying at each stop.

Red Barn Chemicals moved into Lamesa in April, 1959, and missed out on much of the early fertilization.

"We had an excellent business, however," said Mr. Rabb. "Next season we'll likely have more tanks and possibly more applicators. This has proved a good way of selling fertilizer in other cotton-producing areas. Farmers can save money by putting on the fertilizer themselves."

When a farmer takes out an applicator, the company sends out a man to help get it started. He shows the grower exactly how to operate it and then stays until several rows have been fertilized.

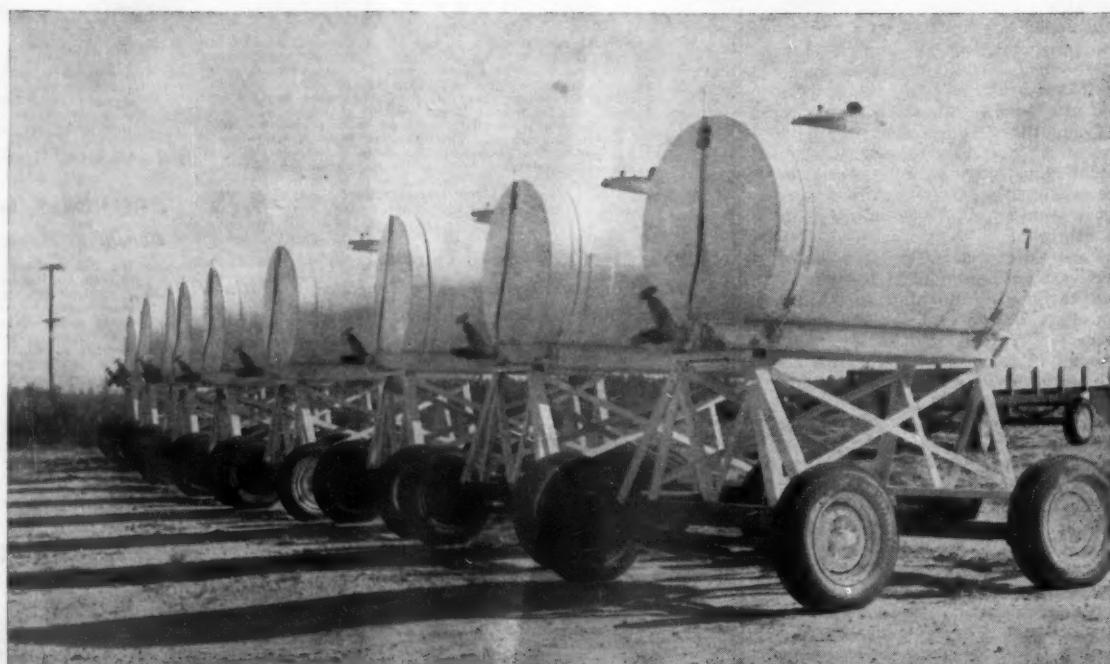
The store has ample local storage and can replenish the big 6,000-gal. holding tanks within a day or so. Most of the fertilizer is shipped in from Etter, Texas, which is about 225 miles from Lamesa.

In addition to fertilizer, the firm sells insecticides, herbicides and cotton defoliants in season. While fertilizer is the main business, these other chemicals help provide a year-around business. Insecticides are sold from spring until September, then farmers defoliate their cotton.

A few things this successful company has learned about selling fertilizer might well be emulated by other companies. Red Barn has found that a firm must also provide information, it must promote sales, and then show the farmer how to use the materials. The business at Lamesa this year resulted from Mr. Rabb visiting the farmers, showing them how fertilizer would pay off, then getting them to buy it from Red Barn.

"A new firm must offer something extra to get started," he said. "This last spring we let cotton growers have our tanks and applicators free of charge. Next year we will charge a fee sufficient to take care of wear and tear on the machines. Farmers don't object to a small charge, providing they get results and good service."

The firm is already getting set for next year. With the South Plains of Texas producing a large per cent of the state's cotton, the area is still using only a part as much fertilizer as needed.



THESE ARE mobile fertilizer tanks which Red Barn Chemical loans to farmers for storage while fertilizing. By welding steel angle irons, tanks have been lifted high enough to allow gravity flow of liquids into applicator tanks. This saves pumping. Only a short hose is needed.

FARM SERVICE DATA

EXTENSION SERVICE REPORTS

The top few inches of soil make up our most important resource, and we cannot afford to allow it to further waste away, according to the California Fertilizer Assn.

Sometimes referred to as the "plough layer," this narrow strip of soil is vital to the production of all our food and fiber, and of the timber we require for shelter.

The Soil Conservation Service of the USDA points out that 65% of all new wealth originates with the proper use of our natural resources, which it says come from the upper few inches of soil of our land. The other 35% originates with the exploitation of non-renewable resources, such as minerals, oil, etc. Since two thirds of our industrial plant needs come from renewable resources, the cost of resulting industrial products would increase sharply if those raw materials had to be produced on worn-out and eroded land.

The association said that the industrial labor force depends principally on the productive capacity of the soil. A tremendous shift in our manpower has occurred, transferring these people from agricultural to industrial pursuits. This has been possible, at the same time we have been provided with adequate food and fiber, only because of increased efficiency and development of new methods in crop culture.

The increased use of commercial fertilizer has been a major factor in this development, according to the association. California farmers used nearly 1,600% more fertilizer in 1958 than in 1920. The figures taken from State Bureau of Chemistry records are—1958, 1,130,344 tons; 1920, 66,880 tons. In spite of this large increase in use, California farmers use on the average only about one half the quantity which should be applied in order to produce the maximum economic crop volume.

The association said that, since proper fertilization, combined with other approved crop production practices would in most cases increase not only crop volume, but quality as well, the farmer would do well to inquire of his fertilizer supplier for specific recommendations, since he is generally familiar with the soil and crop needs in the area which he serves.

★

A housewife buying a steak in a supermarket does not realize that the selection and price of the beef depends, to some extent, on the efficiency with which grass is converted into steak by those four-legged meat factories grazing on California rangeland. One third of California, or 35 million acres, consists of rangeland that has been grazed by cattle and sheep for a century; much of it has never been fertilized until recently, reports Joseph B. Fabry in the California Monthly, University of California alumni publication.

Would it pay to fertilize these distant ranges? If so, which ones? Using what kind of fertilizers? How much? Where? How? Mr. Fabry asks in discussing farmer-university cooperation. To find the answers the fertilizer industries donated materials, ranchers furnished cattle and weighing facilities, and the University Agricultural Extension the know-how in carrying out large-scale range fertilization tests. In 46 tests, lasting five years, and covering more than 13,000

acres in 18 counties, the animals themselves, through their gains in weight, have provided the answers.

Proper additions of nitrogen to open rangeland in many situations more than doubled meat production—from a 60 lb.-per-acre gain on unfertilized ranges to a 165 lb.-per-acre gain on fertilized land. At 22¢ a pound of beef this gain would amount to a profit of almost \$10 an acre over the cost of fertilizer.

Much of the potential rangeland, however, first must be cleared from brush before it can be seeded and turned into much-needed pasture. With cities, highways, and air fields pushing agriculture from coastal and valley lands into the foothills, land must be gained from formerly unused areas, to feed a rapidly growing population. Here again, many questions had to be investigated as to the best method available. Range owners in 21 counties furnished test plots to get the answers. As a consequence of experimentation on these plots we now know that drilling in seed, combined with fertilizer, is superior to all other methods. For instance, drilling resulted in ten times the amount of perennial grasses than broadcasting seed from the air. Properly cleared and seeded land sustained four times as many animals than untreated areas.

★

The "hidden hunger" of grape vines suffering from fertilizer deficiencies can be cured by methods being developed at the University of California, Davis.

An easy chemical test with leaf stems can tell whether a vine needs nitrogen, and a careful check of leaves can reveal any potash deficiency, according to James A. Cook, associate professor of viticulture.

Nitrogen deficiency symptoms don't usually show up until there is a great deal of loss in the crop, Mr. Cook said. For this reason, the chemical test is necessary to analyze for "hidden hunger." The simple test consists of taking leaf stems—or petioles—at bloom time and applying an indicator solution to a cut at the base of each stem. From the color of the solution, the grower knows whether his vines need nitrogen, or whether they have too much.

Grape vines receiving too much nitrogen can suffer yield losses, said Mr. Cook, so applications should only be made if the vines show a deficiency.

If nitrogen is needed, he recommends applying 40 to 60 lb. of actual nitrogen per acre the first year. An annual application of 40 lb. per acre may be used.

The nitrogen should be applied so that it is available in the root zone when growth starts. This will depend on the rainfall in the growing area. Mr. Cook found no difference in nitrogen sources tested.

Most of the work on nitrogen fertilization has been carried on with Thompson seedless, but studies are under way on other varieties.

Spotting a potash deficiency in the vineyard is not as easy as testing for nitrogen, said Mr. Cook, because tissue levels that might reveal hidden hunger are still in developmental stages. At present the grower must learn to identify the deficiency symptoms—gradual fading of green color

toward leaf edges, with edge burn later in the season. This chlorotic condition usually shows up first on mid-shoot leaves in mid-summer. Leaves of Thompson seedless also roll upward around the edges when suffering with potash deficiency. This should not be confused with a virus that causes the leaf edges to roll downward.

Where deficiency symptoms were showing, potash applications of 8 lb. per vine produced yields three times those of unfertilized vines, said Mr. Cook. The fruit was larger, the clusters were longer, the color was more consistent, and the ripening more even on the treated vines.

★

An orchard cover crop is no indicator of the fruit trees' fertilizer needs, according to Omund Lilleland, University of California pomologist.

The cover crop may show response to fertilizers while the trees will not, said the Davis campus specialist. The fertilizer may not be getting down to the trees' deep root zones. Or the cover crop may show no deficiency symptoms while the trees may need fertilizer.

The deeper subsoils frequently have different mineral contents from the topsoil, said Mr. Lilleland. There may be less potash down deep in the soil, for example.

Nitrogen is usually the only element needed by trees in California. However, nitrogen may be over used when early maturity is desired.

Some areas are showing potash deficiencies, said Mr. Lilleland, and large amounts of the material are needed to correct the condition. He recommends 10 to 25 lb. of sulfate of potash per tree. These high rates are necessary to overcome fixation of the element in the surface of the soil. One application will take care of the trees' needs for several years.

But, he said, there is no need yet for widespread use of potash in California orchards. It should be used only where a deficiency shows up.

Sometimes, trees cannot take up the fertilizer they need because of a low overwintering carbohydrate reserve, said Mr. Lilleland. This low reserve is usually caused by overbearing. The roots are weakened and cannot take up the necessary elements. Prune die-back is one of the results of a low carbohydrate reserve. Growers can partly remove some of the excess fruit from the trees to increase root activity and mineral uptake. Prune die-back may also occur where root activity is normal but in soils that are deficient in potash.

★

Results of research at the University of Arizona indicate that ranchers might do well to fertilize their ranges.

The research was done by two graduate students—Gary Holt and J. S. Tixier—working independently on the Santa Rita Experimental Range of the Forest Service.

At this point, they aren't advising the ranchers to hire an airplane and start spreading fertilizer, but they do say the possibility looks promising and ought to be watched.

Mr. Holt tried ammonium phosphate and ammonium nitrate, experimenting with different dosages. He found that the grass nearly doubled in quantity with even the smallest amount of fertilizer. At the same time, he saw cows eating fertilized types of grass that they would not touch when not fertilized.

Mr. Tixier, using ammonium phosphate-sulfate, watched the fertilized grasses grow taller and said they were also greener and leafier.

"Apparently, the grass needs more nitrogen," said Dr. Robert R. Humphrey, range management professor at UA.

Trade Winds

From California

SAN LEANDRO, CAL.—Edward P. Rosa is now operating the J & E Supply Co., at 15927 Foothill Blvd., San Leandro, where he retails farm and garden chemicals and other supplies.

VISALIA, CAL.—Robert R. Oaks has opened the Oaks Nursery Store, at 714 South Watson St., Visalia.

MCFARLAND, CAL.—The McFarland Farm Supply Store is a new retail service opened in this farming community at 300 Sixth St., by William S. Parham.

SAN ANSELMO, CAL.—Sunnyside of Marin, a new nursery, has been incorporated here with a capitalization of \$200,000. Principals in the firm include Donald C. Perry and Warren R. Perry.

SACRAMENTO, CAL.—Charles C. Freeman has opened a nursery at 3218½ Northgate Blvd., in California's capital city, under the name of Chuck's Nursery.

MILLBRAE, CAL.—James H. Wilson is now the sole owner of Peters & Wilson nursery outlet at Rollins Rd. and Millbrae Ave., Millbrae.

CLARKSBURG, CAL.—The Martin Brothers Fertilizer Co. has been incorporated in Clarksburg to process fertilizer. The firm is capitalized at \$75,000, and principals in the company include Darrel E. Pierce and Florence P. Joseph.

FRESNO, CAL.—The American Applicators, offering an agricultural aircraft service, has been incorporated with a capitalization given as \$1 million. The service will apply fertilizer and seeds by airplane to farmers in a large area of northern and central California. Principals in the firm include Thomas R. and Corinne Fisher, and Marion R. Terry.

WOODLAND, CAL.—The Huttman Crop Dusters has been incorporated to offer an agricultural aircraft service to farmers. Howard B. Huttman is principal owner of the firm.

CAMPBELL, CAL.—The Campbell Nursery Co. at 236 North Winchester Rd., Campbell, has been sold and its name has been changed to Norco Nurseries.

SACRAMENTO, CAL.—Marcus E. Askew has opened the Marc-San's Pocket Nursery Store at 2907 Fifty Eighth St. here. A second retail nursery store has been opened here by Wallace H. Starnes, at 516 P St.

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WEED OF THE WEEK

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PURSLANE

(*Portulaca Oleracea*)

How to Identify

The stems of this plant are prostrate, or turned up at the ends. They sometimes form mats a foot or more in diameter from a fibrous root system. The leaves are alternate or clustered, succulent, broadest near the apex, and smooth. They are pale to light green in color. Flowers are small, yellow and formed in the axils of the leaves and stems. Many tiny, black, shiny, flat rough seeds are produced in each pod.

Characteristics of Purslane

This plant is found in cultivated fields, gardens, and in waste places. The purslane is drouth-resistant and grows best in hot, dry weather. It is often confused with prostrate pigweed, but distinguishing characteristics of purslane lie in the

fact that the leaves and stems are much smoother and fleshier than pigweed. Purslane is an annual, reproducing by seed. Its root system is fibrous, and the plant is often called by other names including Pursley, portulaca, and pusley.

Control of Purslane

The plant is susceptible to a number of chemical herbicides which kill the entire organism. Cultivation or hoeing is successful providing the work is done when the plants are small. Scattered plants should be pulled and piled or burned if seeds are being formed, agronomists say, since the plant has the ability to continue to live and its seeds to mature even though they may be pulled or cut off from the root.

Research in the News

Wyoming farmers and ranchers troubled by alkali areas and "slick spots" in low places at the ends of fields probably can reclaim the land by applying gypsum and using good fertilization and irrigation practices, according to Hugh W. Hough, Wyoming University agronomist.

University researchers working on alkali soils near Pavillion from 1954-1958 tripled oat hay and grain yields by treating the soil with 10 tons of gypsum, 100 lb. of nitrogen, 240 lb. of phosphate, and 100 lb. of potash per acre. Amounts of gypsum required will vary with different soils. It is therefore important to have soils tested before treatment.

Researchers can't tell how long the gypsum treatments will last, but gypsum-treated soils—fertilized with 80-100 lb. of nitrogen each year—continued to yield about three times as much as untreated control plots throughout the four-year period.

Plots treated with 20 tons of sawdust plus 400 lb. of nitrogen per acre, and others treated with 20 tons of manure per acre gave higher yields than gypsum-treated plots the first year or two, but didn't hold up the third and fourth years, Mr. Hough notes. Plots receiving fertilizer alone yielded no more than unfertilized check plots.

Gypsum is costly for large-scale reclamation programs, Mr. Hough says. He recommends it to reclaim "slick spots" and greasewood patches at field margins where irrigation runoff has deposited soil salts.

For effective use, gypsum should be spread over the soil surface and worked into the top 4 to 6 in. of soil with a disc or by plowing it under. The University researcher says fertilizer should be applied in usual way or mixed with the gypsum. Yearly applications of nitrogen are essential to good yields from reclaimed land.

University researchers are making further tests to find ways to reduce cost, and to find out if the method is practical for long-term reclamation of large land areas.

Widespread damage from red leaf on oats in Indiana will not destroy the value of desired oat varieties for seed, Keller E. Beeson, Purdue University extension agronomist, reports. Yields and quality are reduced, but the virus disease is not carried by the seed.

Plant lice or aphids are responsible for red leaf spread and no one can forecast their presence in 1960, he adds. While the aphid can be controlled by spraying growing plants, no available seed treatment is effective. In past years, aphids have appeared later in the season than in 1959; thus, red leaf has rarely damaged oats and less frequently wheat.

All Corn Belt states report similar damage to oats. Seed for 1960 planting should be saved from the best varieties for use in the state, Mr. Beeson advises. Early sown oats of all varieties or the early maturing Putnam show the least damage and should be the best quality seed. No variety so far shows effective resistance.

Wheat saved for seed presents a different problem, the agronomist adds. Loose smut or black head is seed borne and is killed only by the difficult hot water treatment. Seed fields should be low in loose smut to reduce the buildup the next year. In certification, the field count must show less than 1% loose smut.

The LaPorte variety, extensively multiplied by certified seed grow-

ers, is resistant to the prevalent race of this disease.

Stinking smut, found rarely in Indiana, is easily controlled by seed treatments.

The problem of low moisture content for safe storage always confronts seed growers. Grain must average under 14% for safe storage. Many experienced growers will not store grain until it tests down to 13%.

Crops are eating up plant food at a much faster rate than midwestern farmers are returning them to the soil in fertilizer form, reports Dr. W. P. Martin, head of the University of Minnesota's soils department.

Citing Minnesota as an example, Dr. Martin says that despite a 14% increase in fertilizer use that brought total consumption last year to nearly 500,000 tons, only about half of the farmers in the state are using any plant food.

"Yet fertilizer is one of the farm-

DEMONSTRATIONS PROVE FRUITFUL

ATHENS, GA.—Six corn production demonstrations in the state, using irrigation and high rates of nitrogen application, are demonstrating that high yields are possible if water and nitrogen are provided.

P. J. Bergeaux, agronomist of the University of Georgia Extension Service, said recently that E. L. Perry of Wayne County has a six-acre field where he is following extension service recommendations.

Mr. Perry followed soil test recommendations, Mr. Bergeaux said, by applying one ton of lime and 900 lb. of 5-10-15 fertilizer per acre. Thirty days after planting he applied 100 lb. of nitrogen through his irrigation system and repeated this application one month later.

Extension agronomists who helped plan and establish the demonstration, along with Harry Hutcheson, county agent, estimate Mr. Perry will make between 150 and 200 bu. an acre. "If he only makes 150 bu. per acre," Mr. Bergeaux said, "the extra cost of the heavy nitrogen applications and irrigation will still be profitable."

ers' best weapons for beating the cost-price squeeze by enabling them to produce more efficiently," says Dr. Martin.

Minnesota soils research indicates that each dollar invested in fertilizer can return \$3 to \$5 in increased profits. Actually, if the return were only \$2 for every fertilizer dollar, the half million tons of fertilizer farmers are now applying would represent a profit of about \$40 million."

Mr. Martin points out that while fertilizer use has been steadily in-

creasing, its rise has not been nearly as great as expenditures for some other improved farming practices. Farm machinery purchases have increased 116% since 1939, he says, whereas fertilizer use has gone up 48% in the same period.

"The upward trend in fertilizer use has been due in part to more soil testing," he says. "Increased soil testing is a welcome development. Testing results in wiser use of fertilizer and, therefore, greater profit increases."

Books on Fertilizers And Their Use

FUNDAMENTALS OF SOIL SCIENCE—Third Edition

By C. E. Millar, late Professor Emeritus of Soil Science; L. M. Turk, director; and H. D. Foth, associate professor of soil science, Michigan State University.

This text completely revises and brings up to date the second edition. Special attention is given to progress made in the basic principles of soil science since the publication of its predecessor. This edition includes more emphasis on soil texture and the concept of the texture profile, more discussion of the influence of the soil forming factors on soil development, and more facts about clay minerals to provide a clearer understanding of the differences in the behavior of soils. 476 pages, illustrated. \$6.95

SOIL FERTILITY AND FERTILIZERS (1956)

Samuel L. Tisdale and Werner L. Nelson

An advanced college text, for juniors and seniors, following background course in soils. Covers elements required in plant nutrition, their role in plant growth, and the soil reactions to these nutrients. Several chapters on manufacture, properties and agronomic value of fertilizers and fertilizer materials. Latter part covers soil fertility evaluation and use of fertilizers in sound management program. Dr. Tisdale is Southeastern regional director of the National Plant Food Institute and Dr. Nelson is with the American Potash Institute. 430 pages, cloth bound

\$7.75

PLANT REGULATORS IN AGRICULTURE

Dr. Harold B. Tukey

Published September, 1954. A text book giving background material for county agents, farmers, citrus growers, nurserymen, gardeners; providing fundamentals and general principles; covers encouragement of roots by plant regulators, control of flowering and fruit setting, parthenocarpy, abscission, prevention of preharvest fruit drop, delaying foliage and blossoming, maturing and ripening, inhibition of sprouting and weed control. Brings together specialized knowledge of 17 authorities in the field, with two chapters written by Dr. Tukey, head of department of horticulture at Michigan State College. 267 pages

\$6.50

THE CARE AND FEEDING OF GARDEN PLANTS

Published jointly by the American Society for Horticultural Science and the National Plant Food Institute.

An entirely new, one-of-a-kind book. It is designed to acquaint readers with nutritional deficiency symptoms or "hunger signs" of common yard and garden plants including lawn grasses, shrubs, flowers, garden vegetables, and cane and tree fruits. It stresses plant feeding, or "what makes plants grow." Sixteen of the nation's leading horticultural authorities collaborated in its preparation. Cloth bound, 300 pages of text and illustrations including 37 pages in full color

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AUXINS AND PLANT GROWTH

A. Carl Leopold

A 364-page book, complete with bibliography, appendix, and index, discusses the fundamental and applied aspects of growth hormone and synthetic auxin action in plants. These are of interest to all workers in agricultural chemicals—for weed control, flowering control, fruit set, flower or fruit drop and plant propagation. The text is divided into two sections, (1) fundamentals of auxin action, and (2) auxins in agriculture. These cover developmental effects of auxins, the physiological and anatomical effects of their application, the chemical nature of growth regulators, and methods of applying auxins and their persistence in plants and soils. Other subjects covered: rooting, parthenocarpy, flower and fruit thinning, control of pre-harvest fruit drop, flowering, dormancy and storage, herbicides, miscellaneous uses of auxins, and potentials of auxins and auxin research.

\$5.00

ECONOMIC AND TECHNICAL ANALYSIS OF FERTILIZER INNOVATIONS AND RESOURCE USE

By E. L. Baum, Earl Heady, John Pesek and Clifford Hildreth.

This book is the outgrowth of seminar sessions sponsored by TVA in 1956. Part I—Physical and Economic Aspects of Water Solubility in Fertilizers. Part II—Examination of Liquid Fertilizers and Related Marketing Problem. Part III—Methodological Procedures in the Study of Agronomic and Economic Efficiency in Rates of Application, Nutrient Ratios and Form Use of Fertilizers. Part IV—Farm Planning Procedures for Optimum Resource Use. Part V—Agricultural Policy Implications of Technological Change. It presents new methodological techniques for more efficient handling of research problems related to fertilizers and provides more meaningful \$1.95 answers to problems of practical application

\$1.95

HUNGER SIGNS IN CROPS—Second Edition

A symposium—published jointly by the American Society of Agronomy and the National Plant Food Institute.

A comprehensive study of nutrient-deficiency symptoms in crops compiled by 19 of the leading authorities in the field. It is being widely used by college professors, research and extension specialists, industrial chemists and agronomists, county agents and teachers of vocational agriculture. Many farmers have found it of particular value in planning their fertilizer programs. Cloth bound, 396 pages, 242 illustrations, including 124 in full color

\$4.50

USING COMMERCIAL FERTILIZER (1952)

Malcolm H. McVickar

Dr. McVickar is chief agronomist for California Spray-Chemical Corp., Richmond, Cal. The book deals specifically with commercial fertilizer, how it is produced and how to use it. It is non-technical. It includes chapters on how to measure fertility of soils, secondary and trace-element plant foods. 208 pages, 104 illustrations, cloth bound

\$3.50

COMMERCIAL FERTILIZERS, Their Sources and Use—Fifth Edition (1955)

Gilbert H. Collings

Based upon the author's practical experience as an experiment station agronomist and teacher, and incorporating information on recent developments by agronomists, chemists, engineers and fertilizer manufacturers. Authoritative on problems concerning commercial fertilizers and their use in gaining larger yields. 160 illustrations, 522 pages

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APPROVED PRACTICES IN PASTURE MANAGEMENT (1956)

M. H. McVickar, Ph.D.

Outlines clearly and concisely how to have productive pastures to furnish high-quality forage for livestock, economically and efficiently. Written for grassland farmers. Covers the important activities associated with establishment, management and efficient use of pastures as grazing lands or as a source of fine winter feed for livestock. It is as specific as possible for all U.S. pasture areas. Twenty chapters, 256 pages, illustrated

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MANURES AND FERTILIZERS

A survey by the Ministry of Agriculture and Fisheries, dealing with soil analysis, inorganic fertilizers, waste organic substances and principles of manuring. In language to give the farmer basic principles of increasing soil fertility by the application of natural organic manures and synthetic inorganic fertilizers. Many important tables on quantitative data

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Potash Institute's \$4,000 Grant to Seek Answers on Forage Crop Use of Nutrient

WASHINGTON—A grant of \$4,000 has been given to Virginia Polytechnic Institute by the American Potash Institute, for a study on the effect of potash on forage crops.

VPI researchers will seek answers to a number of questions, including how various rates of potash fertilizers affect (1) the botanical composition and yield, (2) the ion uptake, (3) the seedling injury, and (4) the winter injury of certain forage crops.

Directed by Dr. R. E. Blaser, nationally known VPI agronomist, the 2-year project will be conducted by Ray E. Worley, a graduate student of Blacksburg, Va.

The VPI soils men will study how

Arkansas Plant Board Creates New Quarantine

LITTLE ROCK, ARK.—The Arkansas Plant Board has announced classification of a new Quarantine Area A under the state's pink bollworm control program.

Officials said the change resulted from the extension of a federal quarantine into the area.

Originally included in Quarantine Area B, the new region is the part of Clay County between the Cotton Belt Railway and the St. Francis River, and the part of Green and Craighead counties east of State Highway 135.

The quarantine includes all gins and processing plants in towns located on highways outlining the borders of the quarantined areas.

Pink bollworms, first discovered in Arkansas in 1958, have been found in both areas, the Plant Board said.

Designation of an "A" area means full control measures will be applied in the region.

Ginners and farm representatives strongly protested the area change at a recent Plant Board hearing.

Gins in the new "A" areas will have to meet the same requirements as all other gins in Area A, including heat-treatment or fumigation of all seed before they are returned to farms.

different rates of potassium and nitrogen fertilizers affect the botanical and chemical composition of forage grasses that have received various rates of nitrogen, Dr. Blaser reports.

They will study how certain combinations of potassium and nitrogen fertilizers influence the stands and growth of forage seedlings. They will attack cold injury on Ladino clover by using potassium fertilizer with and without nitrogen. And they will try to determine what effect temperature and concentration of the absorption medium have on the ion uptake of various forage species.

The experiments will be conducted in the field, in the greenhouse, and in the laboratory. Dr. Blaser explains, "We will use the abscised root technique to study the amount of nutrients different species absorb and their growth temperatures and will use the electric resistance method to correlate with cold injury."

Referring to past VPI research sponsored by the Potash Institute, Dr. Blaser concluded, "Potash Institute grants have always supported research that has helped improve yields, quality, and grass-legume balance. Grass-legume mixtures require more potassium fertilization than legumes grown alone because of the aggressive way grasses compete for potassium. The grasses are invariably higher in potassium content than legumes. The only exception to this is when available potassium is very high in soils."

Identification Error

WINNIPEG—Aster yellows has been falsely reported in flax crops in Manitoba, according to D. L. Smith, extension entomologist, Manitoba Department of Agriculture. Yellow patches in flax fields have recently been mistaken for aster yellows damage. These patches, however, are caused by chlorotic soil conditions rather than the virus disease, Mr. Smith noted.

The incidence of aster yellows in flax is only about 4% and indications are that damage will not be serious this year, he concluded.

Miller Products Buys Assembly Plant

PORLAND, ORE.—Purchase of the former Kaiser-Fraser automobile assembly plant at 7737 N.E. Killingsworth was announced by Miller Products Co., 40-year-old Portland producer of farm and garden chemicals.

Roy E. Miller, president, reports the purchase, remodeling and new construction planned will involve an investment of more than \$500,000.

The move will triple the firm's manufacturing space and will be accompanied by expansion into new product lines and increasing employment from the present 40 up to about 100 persons, according to Frank Stewart, vice president.

The 200 by 300 ft. building will be remodeled and used mainly for warehousing and packaging. Two new structures will be added, a 24,000 sq. ft. building for manufacture of a new line of aerosol products and a 10,000 sq. ft. building for production of weed killers. The expansion project will give the firm more than 100,000 sq. ft. of manufacturing space.

Miller Products was founded in Grants Pass 40 years ago by Roy Miller, then Josephine County agricultural agent. The firm moved to its present location on the Willamette River at the foot of S. W. Carruthers Street in 1926. It makes and markets in eight western states some 165 products for farm and garden, including insecticides, fungicides, herbicides and fertilizers.

Test Plot 'Shows' Fertilization Value

PARAGOULD, ARK.—Although he didn't live in Missouri, C. M. Tillman of near Paragould had a "show me" attitude when it came to fertilizer usage results.

He had to be convinced—by his own demonstration.

Now he thinks the best bet for obtaining good corn yields is to obtain a soil test and follow the recommendations to the letter. A four-acre test plot changed his mind.

Working with Arthur Layton, assistant Green County agricultural agent, he took soil samples and sent them to the laboratory at nearby Marianna for examination.

Agronomists advised him to apply 80 lb. of nitrogen, 40 lb. of phosphate and 60 lb. of potash per acre. He used 6-8-12 fertilizer and 50 lb. of nitrogen as a sidedressing.

One plot was not fertilized. It produced 75 bu. of corn per acre.

The three other plots were fertilized at varying rates. The first received 40 lb. of nitrogen, 20 lb. of phosphate and 30 lb. of potash. It yielded 74 bu. per acre.

Another plot was fertilized exactly according to recommendations, with 50 pounds of the 89 lb. of nitrogen being applied as a sidedressing. It yielded a whopping 106 bu. per acre.

Plot three got 120 lb. of nitrogen, 75 lb. as sidedressing and the remainder in formula mixes. It also received 60 lb. of phosphate and 90 lb. of potash. The yield was 83 bu. per acre.

Mr. Layton believes the yields on the better fertilized plots would have been higher if the corn had been planted more thickly. But he used the same rate of seeding on all plots, with the plants 20 in. apart in rows spaced 38 in.

ARTICLES OF INCORPORATION

LITTLE ROCK, ARK.—The Peoples Growers Assn., Inc., Bay, Ark., has filed articles of incorporation with Arkansas Secretary of State C. G. Hall to operate an "agricultural seed, feed, fertilizer, livestock and poultry business." The charter was granted under Act 153 of the 1939 Arkansas General Assembly, and capitalization was not publicly listed. Incorporators were Robert Holt, Ted Isbell and Arthur Cooper, all of Bay.



James C. Britton

U.S. Potash Names New Agronomist

WASHINGTON—James C. Britton has been named agronomist in the plant food development department of the U.S. Potash Co. division of United States Borax & Chemical Corp. The announcement was made by James A. Naffel, director of the plant food development department. The appointment will become effective Sept. 1. Mr. Britton will be located at West Lafayette, Ind., to direct research and sales development of plant food borates for the midwestern and northeastern areas of the U.S. and eastern Canada.

Mr. Britton, an honor graduate of Alabama Polytechnic Institute, was recipient of the National Plant Food Institute award as the outstanding junior in agriculture in 1958 and the American Society of Agronomy award as the outstanding senior in agronomy in 1959. Before entering Alabama Poly, he served three years as an army paratrooper with service in Alaska.

Cyanamid Ad Manager Assigned Additional Duties

NEW YORK—Frank H. Cappy, advertising manager for American Cyanamid Co.'s agricultural division, has been assigned additional responsibilities for public relations and packaging development, it was announced recently by B. F. Bowman, divisional marketing director.

Mr. Bowman also announced the appointment of promotion managers for each of the division's three basic products categories.

Appointed to the newly created posts are R. G. Tousley, phosphates and nitrogen department; E. B. Shaw, pesticides, and S. B. Bromley, animal industry products. Dr. L. W. Groves has been named assistant promotion manager for animal industry products.

The new managers will be responsible for all phases of sales promotion and advertising for their product lines, Mr. Bowman said.



R. V. Scott



A. F. G. Raikes



J. B. Goolsby

Bemis Announces Three Eastern Personnel Changes

ST. LOUIS, MO.—Three personnel changes within the eastern operations of the Bemis Bro. Bag Co. were announced by F. G. Bemis, president. R. V. Scott, director of eastern operations and company director, New York, will transfer to St. Louis as assistant director of sales for the company.

A. F. G. Raikes, manager, New York general sales division, will assume Mr. Scott's duties as director of eastern operations, and will be succeeded by J. B. Goolsby, area sales manager at the Brooklyn sales division.

Mr. Scott, who joined Bemis at its Kansas City plant in 1931 as an accountant, has served as director of

eastern operations since early in 1957. He previously served six years as manager of the company's Chicago general sales division.

Mr. Raikes began as a sales representative with the company, joining the Kansas City sales division in 1938. The following year he was transferred to St. Louis as a member of the trade extension department (now the company's general sales department). In 1943, he was named assistant to the director of sales and five years later, assistant director of sales. He transferred to New York in 1953 as manager, New York general sales division.

Mr. Goolsby's entire service with Bemis, 22 years, has been in the Brooklyn sales division. In 1953, he was named an area sales manager and placed in charge of accounts in New England, Long Island and portions of Manhattan.

SPRAYING ENDORSED

BOSTON—Careful use of aerial spraying of insecticides has been endorsed by the New England section of the Society of American Foresters.

A recently enacted resolution endorsed the controversial technique after a year-long study of spraying programs throughout the country including those against spruce and budworm in Maine and gypsy moth in southern New England and New York.

The resolution calls for strict control and planning, and cites as an example the successful Maine program conducted in June against the spruce budworm in northeastern timber areas.

Eradication Plans For Pink Bollworm Told in Arkansas

LITTLE ROCK, ARK.—The new state committee for pink bollworm eradication made initial plans to rid Arkansas of the insect at its first meeting held here recently.

The committee was formed at the suggestion of Gov. Orval E. Faubus.

C. A. Vines, agricultural extension service director and chairman of the committee, said the group would outline a complete program aimed at ridding the state of the pink bollworm.

He said: "We will have a complete aggressive program that will lead to the eradication of the bollworm by the destruction of all cotton stalks in the state."

"If we destroy all stalks," he said, "the insect will not have a chance to hibernate during the winter."

"The state's bollworm problem isn't large enough that it can't be eradicated by control methods," he added.

Under a two-point plan drawn up by the committee, letters will be sent to each county agricultural agent, asking for formation of county eradication committees. (Mr. Vines feels this will promote more local interest in the program.)

Also, posters and circulars explaining the stalk destruction law will be mailed to all cotton farmers and ginners by the Arkansas-Missouri Ginners Assn.

Mr. Vines pointed out that the law requires destruction of all cotton stalks by Jan. 31, except on land where wind erosion is a problem. In these cases, special permission must be obtained from the State Plant Board to turn the stalks under at a later date. In any case, they must be underground by May 1.

Citing figures from 1958, officials said they believe the program will be even more successful in the future.

Floyd Fulkerson, Little Rock, chairman of the Plant Board, reported that only 200 farmers declined to comply with the destruction law last year.

He said the idea for an "educational program" came after the General Assembly reduced the appropriation for "policing the state to enforce the law."

The Legislature cut the \$173,000 appropriation for insect control to \$75,000 after passing revenue stabilization laws. In the original bill, \$62,000 had been set aside for enforcing the stalk destruction law, Mr. Fulkerson said.

The Plant Board asked Gov. Faubus to allocate extra funds from his emergency account, but he said the money wasn't available. The suggestion for the new committee followed.

Formation of the group came a few days after a Plant Board hearing on proposed changes in the control program. A number of groups opposed the changes, but the lack of adequate financing forced start of an "educational" campaign. (CropLife, Aug. 10, P. 21.)

Pink bollworms were first discovered last year in parts of Green, Clay and Craighead counties.

Fertilizer Firm Helps Sweet Potato Marketing

VALDOSTA, GA.—The Georgia Fertilizer Co., in Valdosta, has taken over the marketing of sweet potatoes at the state farmers market. Howard Fambrough, agronomist for the fertilizer company, said his firm took over the industry to provide enough funds for operation of the undertaking.

The Vegetable Growers Assn. is backing the fertilizer concern and members of the association are urging the farmers to sell their crops through the Valdosta market to insure the best possible prices and other benefits.

Mississippi Agents Propose Plan to Raise State's Cotton Income

GREENWOOD, MISS.—A program to bring millions of dollars more into Mississippi by preserving the quality of cotton was launched here Aug. 6 at a Delta-wide meeting of county agents and other agricultural leaders.

The agents will lead campaigns in their counties to show cotton growers and others why quality pays and how to get it. Cooperating will be other agricultural agencies, county cotton committees, Farm Bureau, Delta Council, National Cotton Council and others.

Growers were urged to keep their fields clean of grass and weeds late in the season, especially where the cotton will be harvested mechanically. Grassy bales are docked 4¢ per pound.

American cotton competes with

some 20 different cottons in world trade, pointed out Dr. C. R. Sayre, president, Staple Cotton Assn., Greenwood.

"We've got to compete with those folks and we can compete in only quality and price," he stated.

"Under the proper field conditions there is no reason for a producer to suffer a penalty of \$10 to \$20 per bale on machine picked cotton," said J. K. Jones, agricultural engineer, National Cotton Council, Memphis.

"Quality is made in the field. Harvesting can never improve this quality, but poor practices can damage it. On the other hand, good harvesting and handling practices preserve and deliver to the gin whatever quality is in the cotton at harvest time," Mr. Jones explained.

Stressing the importance of late-season control of grass and weeds, Mr. Jones stated: "A large crabgrass plant every 60 ft. in the drill can result in a loss of as much as \$20 a bale."

South Carolina Totals Down in July This Year

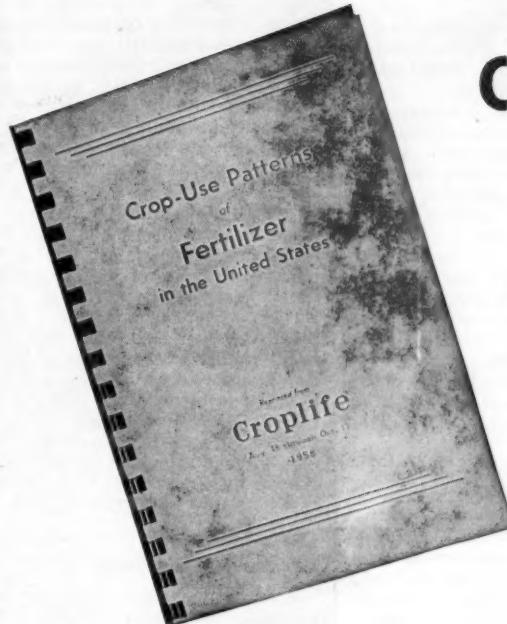
CLEMSON, S.C.—With the exception of phosphatic materials which showed a significant increase in use, consumption of fertilizers in South Carolina during July, 1959, were considerably below the figures of that month a year ago. According to a report by Dr. Bruce D. Cloaninger, director of fertilizer inspection and analysis for the state, mixed fertilizers were down 29.1%, dropping from 8,369 tons in 1958 to 5,933 tons in July, 1959.

Nitrogenous materials were down 30.6%, the respective figures for July, 1958 and July, 1959 being 7,699 and 5,346 tons.

Potassic materials showed no change, the total tonnage being 133 for July in both years.

Phosphatic materials, the only bright spot, increased 77.5%, from 236 tons in 1958 to 419 tons in July of this year.

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Crop-Use Patterns of Fertilizer in the United States

by

J. R. ADAMS L. B. NELSON D. B. IBACH
U.S. DEPARTMENT OF AGRICULTURE

This significant report was compiled by the U.S. Department of Agriculture after thorough studies of fertilizer use in the United States. Crop-Use Patterns covers questions which, until now, have not been adequately answered. Crop-Use Patterns is based on information gathered from every fifth farm surveyed in the most recent U.S. Census . . . providing a broad base of national information.

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WEATHER

(Continued from page 7)

the change takes place is important. There are now believed to be two main processes acting in nature. One of these is by collision, or joining together of the small droplets, called the coalescence process. This process requires that some droplets be larger than others. Having a different motion, they collide with and sweep up smaller droplets, thereby growing, in time, to raindrop size. The other process requires the presence of ice crystals which are small, flat, six-sided crystals of ice, somewhat larger than the droplets. These crystals collide with and sweep up the droplets, and grow gradually to a sort of granular snow, or under special conditions, when there are a large number, into snowflakes. In falling, both the snow pellets and snowflakes may melt to form rain.

Since each droplet and ice crystal is formed around a core or particle called a nucleus, it has been supposed that at times there may be a shortage of these natural substances or chemical particles and that we might be able to add a supply of them to the air as artificial nuclei. Up to the present, it is believed that the most promising artificial nuclei would be silver iodide smoke or dry ice, both having a crystal structure much like ice, or by adding large salt particles or water spray to encourage the formation of larger droplets and the collision or coalescence process. In Canada it is likely that in summer, most of the rain results from the collision of water droplets, while in winter, with air temperatures generally below freezing, the ice crystal process would be the most important.

Difficult to Secure Conclusive Results

Addition to the air of water sprays, large salt particles, dry ice and silver iodide have all been tried. Of these, because of the expense involved in using aircraft or for other reasons, the release of silver iodide smoke from ground generators has been most widely used. Results have not been clearcut or conclusive for a number of reasons and, despite the considerable amount of silver iodide seeding, there is continuing controversy and differing opinions on the value of the seeding.

One of the reasons is that, although measurements have indicated there are occasions when there is a shortage of ice crystal nuclei, we do not know how often this occurs, nor do we know what the situation is on a particular day. On those occasions when there is no shortage, and particularly when coalescence is taking place, the possibility exists that the

CUMULUS FORMATIONS—Pictured are typical cumulus cloud formations. Note the hard outline of the formations marked A; these are composed of water droplets.

Then note the diffused outline of formations B; these clouds are composed of ice crystals. (National Research Council Photo.)

addition of silver iodide could be detrimental, since hail might result if the droplets were not converted to ice crystals very rapidly.

Although laboratory experiments have increased our knowledge considerably, we do not know as yet whether or not there may be other important factors operating in nature as controls on raindrop formation. Further, the effect on clouds varies a great deal with the different cloud types and even with the same type from one day to another, and in different parts of the same cloud formation. It may be that the silver iodide smoke does not get up to the right parts of the cloud in an active state on those occasions when it could affect the processes.

Types of Clouds, Their Potentialities

In general, it is believed that Cumulus—the isolated heap clouds—offer more promising targets, since they may fail to give rain by a narrow margin. In winter, when the droplets are at temperatures below freezing but still liquid, that is when they are super-cooled and precipitations would occur if the clouds were only one or two thousand feet taller, seeding with silver iodide would likely be successful. In summer situations, with temperatures above freezing, and the ice crystal process not operating, silver iodide seeding would have no effect, but water sprays or seeding with large salt particles might affect cloud formation.

With Stratus or layer clouds the most promising results should be obtained where up-slope winds form extensive cloud sheets on the windward sides of mountain ranges. Although the results of seeding layer clouds vary a great deal, in at least 75% of the experiments conducted some change in structure was observed. In many cases, with aircraft seeding from above, either holes or hollows were produced in the seeded path.

An important question, and one that was early recognized by those who were attempting to assess the results of cloud seeding experiments was, "How much rain would have fallen naturally?" In reply, it may be said that studies in cloud physics had not then reached the stage where an answer could be given on a purely physical basis; nor, despite steady advances in the knowledge of the processes that operate in clouds, are meteorologists much closer to being able to answer the same question today. Because of this, methods of eval-

uation have been essentially limited to: (1) "Statistical," in which data are analyzed by mathematical methods, and (2) "Physical," in which direct and indirect observations are made. These methods, with their potentialities and their limitations will, in fact, have to be used for some time.

Since there is no way to measure or forecast accurately what rainfall would have occurred had there been no seeding, the analyst has to rely upon an estimate of the rainfall that would have occurred. Some of the earlier analytical procedures were based on the assumption that there is a "normal" or average precipitation figure. But the weakness of such a figure is obvious. As there is frequently a wide variation from one year to the next, if the so-called "normal" precipitation did happen to occur in any one year, it would have to be considered an abnormal event.

Other Statistical Approaches Examined

Another technique that has been employed is referred to as a "regression" analysis. This consists of comparing the rainfall on the seeded (target area) with the rainfall on a controlled area (a nearby unseeded area) which is assumed to have similar rainfall under natural conditions. Rainfall on both the target and control areas, over a recorded period of time (prior to the seeding) is studied to determine the relationship between them. The relationships may then be expressed in a formula so that the amount of rainfall that would be expected to fall in a seeded area can be calculated from known amounts in the unseeded area. The difference between the expected and the actual rainfall on the target area is assumed to indicate the effectiveness of seeding. Practically speaking, while the relationships between target and control areas may appear to be statistically good over an historical period, the wide variations in rainfall over areas not far apart for individual storms are well known and introduce weaknesses into the application of the formula for seeded storm periods. Although uncertainties can be minimized to some extent, they can only be eliminated by carrying out what is called a "randomized" operation. The randomized seeding program is one in which the test occasions are divided into two groups, one of which receives the seeding treatment and the other of which does not, the selection of cases for the two groups depending on a purely random choice. The effect

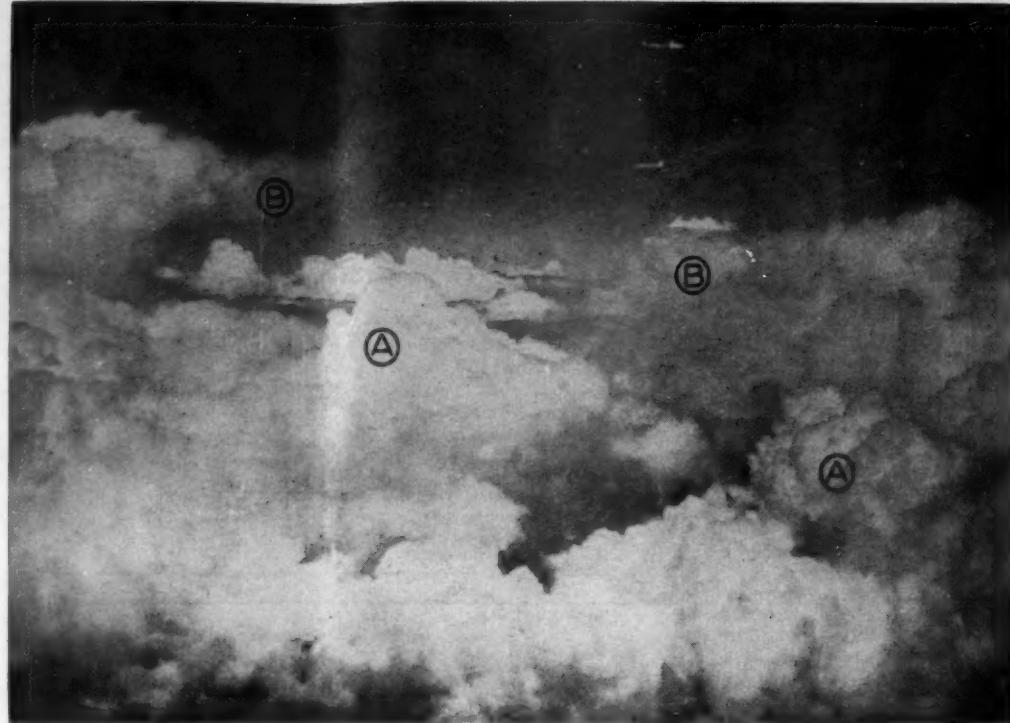
of such a system is to provide a simple and complete guarantee of a valid interpretation of the results of the test, regardless of disturbances and uncertainties arising from incomplete control over the conditions of the test. One important advantage of a randomized project is that, since historical data giving the average rainfall over a number of years need not be employed, it is possible to install adequate rain gauges to sample target and control areas. This makes the results more significant and increases the sensitivity of the test. In short, a randomized project brackets possible effects of seeding much more accurately than a non-randomized project. In addition, only a randomized project offers any hope of distinguishing between seeding effectiveness in different months and under different meteorological conditions.

All the foregoing statistical methods of evaluating have been used so far in varying degree in assessing the cloud seeding operations that have been carried on in the U.S. and Canada. In future articles on this subject, mention will be made, on occasion, of this or that method having been followed. Greater statistical refinements are, of course, being made all the time and the work of statistical evaluation should widen and prove more accurate as experience is gained in this field.

As suggested, use has been made, too, of physical evaluation programs, especially in cases where statistical analyses were difficult to pursue. This type of analysis is, in effect, an attempt to secure evidence of results from cloud seeding operations either by direct or indirect observation. It has taken the form of intensive studies using radar, aircraft, special cameras and mountain observatories, to observe the effects of seeding at various locations and under varying cloud conditions. Unfortunately the concepts behind seeding experiments to-date have been almost entirely qualitative. That is to say there is, as yet, no quantitative theory describing the formation and production of precipitation nor are there sufficient detailed observational data upon which to construct one. In any case meteorologists suggest that the techniques of dispersing seeding materials in appropriate concentrations and at the right place and time will certainly demand great skill and proper adaptation to particular circumstances.

EDITOR'S NOTE

THE information contained in this weather article has been assembled by the Searle Grain Co., Ltd., from various sources in an attempt to answer some of the questions that have been raised about the important but still very controversial subject, "Weather Modification." It is based chiefly upon U.S. and Canadian scientific and official reports and statements, the latter having been made available by the Meteorological Branch, Department of Transport, Toronto, to whom grateful acknowledgement is made for the information supplied and assistance given.



SCHOOLS

(Continued from page 1)

should be developed and maintained among all employees. Adequate medical or first aid care should be available for all injuries and records should be kept to show the circumstances of accidents and used as a guide to prevent recurrence of such mishaps.

Accident prevention is a profitable effort, he emphasized. Not only do the accidents themselves cost in direct charges, but other factors make the expense of mishaps intolerable. With a good safety program under way, he said, a plant's production is enhanced, with better morale among the men and a more profitable all-round operation.

Mr. Benson warned, however, that even when a good record is being made, management and employees must remain alert lest safety efforts be relaxed and an accident should happen.

Mr. Smith, in his paper, re-emphasized what Mr. Benson had said about the importance of safety. He declared that a plant's responsibility toward the men it hires is to keep them from getting hurt, and it is as much the duty of a supervisor to perform this phase of his work as it is to meet production and quality standards. "In addition to human suffering, accidents cost money. The worker loses wages and the company loses production and has to pay compensation costs. The supervisor who enjoys an accident-free record usually has the confidence of his workers and gets good production and quality results," Mr. Smith added. "The reason for this is that people work best when they don't have to worry about getting hurt."

Other tips to supervisors included knowing the importance of safety; knowing the principal causes of work injuries; training workers to do their jobs safely; explaining safety rules to all workers; taking steps to prevent minor injuries from becoming serious; enlisting the active participation of workers in the prevention of accidents, and lastly, setting a good example before the men.

A flip chart sheet talk by Ed Croushore of NSC brought the school up to date on personal factors in safety, describing unsafe acts and what to do about them. He pointed out that simple, commonplace things may cause accidents, and it is easier to correct unsafe conditions than it is to correct lack of skill or knowledge on the part of employees. The attitude of people in the plant is of utmost importance, he declared. It is the responsibility of supervision in the plant to help the men to develop good attitudes and to prevent accidents rather than merely placing blame when one does occur.

Mr. Creel presented a talk on discovering accident hazards, stating that plant inspections are the "bread and butter" of any safety program. If the hazard is discovered, a correction can be found, he emphasized, but declared that supervisors or others making a plant inspection, must know what they are looking for. Inspections should be made regularly and recommendations followed up. Recommendations should be written so they may be reviewed later and checked on.

That a major portion of accidents in fertilizer plants comes from material handling was the statement of Richard Read, Illinois Farm Supply Co., East St. Louis, Ill., who showed photographs of conditions leading to possible injury in plants. Vertical walls of stored materials are "made to order" for serious injury to shovel operators or others who work close enough to the pile to be hit by falling or sliding pieces, he said.

A good rule of thumb, he said, is for the truck shovel operator never

to dig into a high pile of material with the shovel at maximum height. He told of one serious mishap where an overhang of material rolled down the elevated shovel onto the operator, injuring him badly.

Other factors covered by Mr. Read included the importance of selecting motor operators who possess good reflexes and a stable attitude, rather than the "cowboys" who tend to drive too rapidly through aisles and do other unseemly acts such as attempting to push railway cars with their machines. "These operators would try to scratch their backs with the shovel, if they thought they could," he observed.

Mr. Read pointed out some of the hazards of belt conveyors and re-emphasized the necessity of stopping the machine before attempting to clean out dust and dirt.

The transferring of liquids and anhydrous ammonia from car to storage tank was also covered by the speaker.

"Safe Use of Liquid Materials in a Fertilizer Mixing Program" was described in a talk by L. L. Lortscher, Spencer Chemical Co., Columbus, Ohio. His portion of the school instruction included unloading trucks and tank cars, proper storage and use in process equipment. He outlined the safety equipment needed to prevent personal injury in case of an accident.

An "all-student" participation program conducted by Glenn Griffin, NSC, brought out the answers to a number of questions posed by class attendants. Questions covered adequate authority needed by a supervisor to operate a safety program; how to prevent dangerous operation of hydraulic lifts and other equipment from outside the machine (rather than from the driver's seat); what to do about wet and slippery floors; and how to train temporary help during the rush season.

Lively discussions brought out numerous points. Some foremen present declared that any violation of safety rules should be punished by firing the offender. Others said a man should have another chance after proper warning. Agreement was found in the area that getting a good man in the first place is highly desirable.

The problem of slippery floors appeared to be a universal one. Good housekeeping, that is, keeping dust at a minimum at all times, was recommended as a good practice for preventing part of the moisture accumulation appearing on extra humid days. One student observed that having a non-leaky roof would help, too. Another described his plant floor as looking like a swimming pool during moist days. Efforts to "keep fighting" slipperiness, with warnings to truck drivers and other workers to be extra careful, were agreed as at least part of a solution.

Training temporary workers was regarded as the biggest headache from a safety standpoint. With little time to indoctrinate the extra crews and with a generally poor class of workers involved, the problem of maintaining safe working standards is a difficult one, the men agreed. These suggestions were made, however: plan the hiring ahead of time so there will be opportunity for indoctrination. Providing ample supervision for the inexperienced workers was pointed out as a necessary factor, but in some cases, the men recalled, the new help outnumbers regular employees 4 or 5 to one. Preparing a series of pictures of right and wrong ways to do certain jobs was indicated as being about the best possible way to instruct new workers.

A talk on the safety aspects of fertilizer-insecticide mixtures was pre-

sented by Lloyd Stitt, Velsicol Chemical Corp., Chicago, on Aug. 19. He described safe procedures, tolerances to be observed, safety equipment involved and the problem of labeling to meet various laws governing these mixtures in different states.

Three safety films were shown during the course of the school. The pictures, in sound and color, emphasized the importance of the supervisor's role in plant safety.

Grasshoppers Increase, Vermont Specialist Warns

BURLINGTON, VT. — Grasshoppers, making the most of a dry season, are on the increase in the state and brought warning to farmers from Dr. George MacCollom, Vermont extension service entomologist.

"These hoppers," Dr. MacCollom said, "can eliminate entire stands of hay, small grains and legumes. Their damage is much more severe under drought conditions."

The extension entomologist said potato leafhoppers also are increasing rapidly, with leafhopper burn prevalent on alfalfa throughout the state.

"Under stress conditions," he said, "the potato leafhopper and grasshoppers can make the difference between a second or third cut and no cut."

BIGGEST COTTON CROP

SACRAMENTO—A cotton crop of 1,980,000 bales is estimated by the California Department of Agriculture for California based on Aug. 1 crop conditions. A crop of this size would exceed the previous record of 1,818,000 bales produced in 1952 by 9%. Last year, 1,604,000 bales were grown. The ten-year average is 1,424,000 bales.

Mississippi Co-op Announces Fertilizer Plant Construction

JACKSON, MISS.—Plans to construct supplemental facilities for production of liquid fertilizer at the Mississippi Federated Cooperatives' plant at Canton, Miss., were released at the executive session of stockholders.

J. L. Woodall, MFC's fertilizer manager, said construction will start immediately.

"Mississippi Federated Cooperatives is planning to enter production of complete liquid fertilizers with this first supplemental plant at Canton," Mr. Woodall said.

"Ultimately we expect to install supplementary facilities for the production of liquids at both the New Albany and Meridian MFC plants," he added.

This bulk station at Port Gibson is the first MFC sponsored distribution in the hill counties of Mississippi, Mr. Woodall explained. He added that some four or five more stations are planned for the southern section of the state.

Introduction of N-Sol 32 by MFC is a joint effort with Mississippi Chemical Corp., which plant produces 100 tons of urea daily. From this some 40% is reduced to the liquid form.

Complete liquid mixtures to be produced will include 8-8-8, 7-14-7 and 12-6-6. These will be liquid fertilizers for all general agricultural uses. The changeover in production from dust to pelleted fertilizers at all three MFC plants—marketed as Clover Brand varieties—was made in 1957.

PATENTS and TRADEMARKS

2,899,354

Decylthioacetic Acid Diethanolamide as Fungicidal Agent. Patent issued Aug. 11, 1959, to Alois Kleemann, Basel, and Jakob Bindler, Riehen, near Basel, Switzerland, assignors to J. R. Geigy A.-G., Basel, Switzerland. An agent for the control of fungi comprising as an active ingredient decylthioacetic acid diethanolamide in a fungicidal amount, and a fungicide adjuvant as a carrier therefor.

2,899,355

Method for Combating Fungus and Fungicidal Composition The refor. Patent issued Aug. 11, 1959, to Edward R. Degginger, North Syracuse, N.Y., and Everett E. Gilbert, Morris Township, Morris County, New Jersey, assignors to Allied Chemical Corp., New York. A fungicidal composition adapted for combining with a diluent for application, which comprises tetrachlorocyclopentadiene as active ingredient, and a minor amount sufficient to stabilize the tetrachlorocyclopentadiene against oxidative deterioration of an antioxidant of the group consisting of alpha naphthol and 2,6-ditertiarybutyl-para-cresol.

Industry Trade Marks

The following trade marks were published in the Official Gazette of the U.S. Patent Office in compliance with section 12 (a) of the Trademark Act of 1946. Notice of opposition under section 13 may be filed within 30 days of publication in the Gazette. (See Rules 20.1 to 20.5.) As provided by Section 31 of the act, a fee of \$25 must accompany each notice of opposition.

Replantonic, in hand-drawn letters, for fertilizer. Filed Jan. 28, 1959, by L. C. Schuler Co., Inc., Marshall, Minn. First use Nov. 1, 1958.

MH, in capital letters, for plant growth inhibitor and herbicide. Filed

July 26, 1957, by U.S. Rubber Co., New York. First use July 26, 1951.

Fumagon, in capital letters, for soil, lawn and turf treating agent against nematodes. Filed Feb. 4, 1959, by Wilson & Toomer Fertilizer Co., Jacksonville, Fla. First use Jan. 1, 1958.

Sta-Green, in capital letters, for chelated agricultural minerals used as plant nutrients. Filed Feb. 24, 1958, by J. J. Maugut Co., Los Angeles. First use April 5, 1957.

Design, Tensoloom, in hand-drawn letters with unusual shaped T, for horticultural perlite. Filed March 28, 1958, by Tennessee Products & Chemical Corp., Nashville, Tenn. First use April 15, 1957.

KO-K-O, in capital letters, for mulching and soil-conditioning materials. Filed Nov. 20, 1958, by Hershey Estates, Inc., Hershey, Pa. First use August, 1946.

Thomas P. Mericle, Jr., Named Sohio Salesman

LIMA, OHIO—Thomas P. Mericle, Jr., has just been appointed to the position of agricultural sales representative with headquarters in Louisville, Ky., for the Sohio Chemical Co. of Lima, according to George W. Cosper, manager of agricultural sales.

Mr. Mericle has been with Sohio since July of 1958 and most recently has been staff assistant in the agricultural sales section.

He graduated from the University of Michigan in 1954 with a bachelor's degree in business administration and in 1958 with a master's degree in business administration.

Croplife

A WEEKLY NEWSPAPER FOR THE FARM CHEMICAL INDUSTRY

The regional circulation of this issue is concentrated in the Western states.

Chemical Brush Killers Get Approval of Arkansas Leaders to Clear Valuable Land

AFTER A POLICY of "wait and see" over the period of several years, agricultural officials in Arkansas have given their nod of approval to use of 2,4,5-T as a brush killer to clear large areas of the state for conversion to grasslands. This act would not be particularly noteworthy in many states, but Arkansas has been the scene of many hot discussions regarding the use of herbicides.

These products, employed by rice growers for weed control, were allowed to drift sometimes over to adjacent cotton fields with rather damaging results. As is often the case, the herbicidal chemical got the blame and a great deal of agitation resulted from such instances.

A description of the situation through the eyes of a writer in the "Arkansas Gazette," Little Rock newspaper, is revealing. He points out how land which formerly had produced cotton and corn fell idle because the owners could no longer show a profit on those crops. Persimmon sprouts and other unwanted shrubs began a creeping invasion of the open fields.

Trying to control these plants with hoe, axe or bulldozer was economically out of the question, of course, and the battle was fast being won by the persimmon bushes which used up about all the available moisture from the soil and produced no return to the landowners. Obviously the best method of control was the use of herbicides. Herbicides? Those chemicals that do so much damage?

"Apparently the University now has concluded that 2,4,5-T can be used without creating hazards," the article observes. So a recommendation was presented for 1960 before the Agricultural Conservation Program development group recently. The resolution, made by Dr. Dale Hinkle of the University was carefully worded to prevent indiscriminate use of the brush killer on land where destruction of timber might create an erosion hazard, and he also specified that the materials should not be used on saleable or potentially saleable timber.

"The immediate problem, from the viewpoint of the agricultural workers, is whether to approve the chemical brush treatment in the Agricultural Conservation Program for 1960," the article says. "If it should be approved as a practice, the government would share the cost of the work with the farmers who wished to clear their overgrown fields. Even if it is not approved, many farmers will use 2,4,5-T next year."

"This year it has been estimated that 250,000 acres of Oklahoma land will be treated under the ASC program. It has been estimated that Arkansas farmers have treated more than 75,000 acres of land with government aid.

"Several farmers and persons in jobs related to agriculture have urged the adoption of brush control in the ACP handbook.

"Gordon Boles of Dardanelle estimated that a good brush and weed control program would increase the carrying capacity of overgrown pasture land by 400%. Mr. Boles sprayed 500 acres of pine timberland last year. This, of course, is not quite the same thing as the proposed ACP practice that would apply only to potential grassland. Spraying of timber land is designed to kill the weed trees and allow the pines to grow more rapidly. It is practiced by many lumber companies.

"Perhaps the whole program could be clarified by the use of more specific terms and by an explanation of the necessary safeguards.

"In discussing chemical sprays the term 'low-quality timber land' is often used. To people familiar with Northwest Arkansas, this carries the connotation of steep hills and mountainsides covered with scrub oak timber. It is likely that the clearing of this land would be uneconomical and would create erosion hazards in many places.

The greatest potential returns probably would be from the relatively level fields that were once in cultivation. Since persimmons are the common weed trees on these fields, no stretch of the imagination could classify them as timber areas. The emphasis, it seems, should be placed on reclaiming land that was once in cultivation.

"Farm commodities are plentiful now and it may be argued that we do not need the land. The fact remains that the population is increasing rapidly and it is unthinkable that 3,500,000 acres of land should continue indefinitely to lie idle."

The industry is pleased to see this type of thinking being expressed on the part of agricultural leaders in Arkansas. It is typical, we hope, of a favorable second look at herbicides for very practical use. The fact that these people are regarding the chemical control of weeds as important on the state's more valuable lands is itself a hopeful sign.

Pesticides on Cotton

THE ECONOMIC importance of controlling insect pests on cotton should be a matter of record and an unquestioned fact. But there are still some doubters along the line, apparently. At least enough to prompt Louisiana State University to put out a recent editorial bulletin on the subject. Some of the points covered might help to bolster any sagging confidence on the part of pesticide salesmen or dealers who might have run into doubters of late.

The Louisiana bulletin says that its own entomologists and those with the agricultural extension service have come up with this answer to the question: "It pays very well." As proof, they cite experiment station results over a long period of years illustrating the soundness of this conclusion. The bulletin reports:

"In studies conducted in Louisiana over the past 30 years, fields treated for insect control have averaged about 25% more cotton an acre than was produced on untreated fields. In 20 years of research in Texas, fields that were treated for insect control have averaged about 40% more cotton than was produced on untreated fields.

"The amount of poisoning that is necessary varies from year to year, of course, depending on insect and weather conditions. The exact amount of insect control that is obtained depends on the weather and, especially, on how scientifically the poisoning is done. Occasionally a grower will make a fairly good crop with little insect control. But the answer generally is that insect infestations were light that year or that he benefited from poisoning by other growers that held down the number of insects in the vicinity. The grower who depends on such a break every year is going to find himself in trouble.

"The entomologists emphasize that poisoning for insect control must be done at the right time, in the right amounts, with the right insecticides. When that is the case, the grower's investment in insect control pays bigger dividends than anything else, unless it's his investment in fertilizer."



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CROPLIFE is a controlled circulation journal published weekly. Weekly distribution of each issue is made to the fertilizer manufacturers, pesticide formulators and basic chemical manufacturers. In addition, the dealer-distributor-farm adviser segment of the agricultural chemical industry is covered on a regional (crop-area) basis with a mailing schedule which covers consecutively, one each week, four geographic regions (Northeast, South, Midwest and West) of the U.S. with one of four regional dealer issues. To those not eligible for this controlled distribution Croplife subscription rate is \$5 for one year (\$8 a year outside the U.S.). Single copy price, 25¢.

LAWRENCE A. LONG

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MEETING MEMOS



Sept. 30-Oct. 1—Fourth Southeastern Fertilizer Conference, Atlanta Biltmore Hotel, Atlanta, Ga.

Nov. 12-13—Southwest Fertilizer Safety School, Tropicana Motor Hotel, Pasadena, Cal.

1960

Feb. 8-9—Southwestern Branch, Entomological Society of America, Hilton Hotel, El Paso, Texas.

July 13-15—Eleventh Annual Fertilizer Conference of the Pacific Northwest, Hotel Utah, Salt Lake City; B. R. Bertramson, State College of Washington, Pullman, Wash., chairman.

July 27-29—Great Plains Agricultural Council, 1960 meeting, Laramie, Wyo.

Meeting Memos listed above are being listed in this department this week for the first time.

Classified Ads

Classified advertisements accepted until Tuesday each week for the issue of the following Monday.

Rates: 15¢ per word; minimum charge \$2.25. Situations wanted, 10¢ a word; \$1.50 minimum. Count six words of signature, whether for direct reply or keyed care of this office. If advertisement is keyed, care of this office, 20¢ per insertion additional charged for forwarding replies. Commercial advertising not accepted in classified advertising department. Display advertising accepted for insertion at minimum rate of \$11 per column inch.

All Want Ads cash with order.

HELP WANTED

OPPORTUNITY IN EL PASO, TEXAS—for qualified young man, with experience in selling to the institutional trade—such as grocery stores, hotels, restaurants, hospitals, schools, etc. Experienced in selling canned goods, flour, sugar, beans, rice, etc. Write giving details of sales experience, age, references, photo, etc., to: Mr. E. C. Held, President, Held Bros. Corp., P. O. Box 98, El Paso, Texas.

OPPORTUNITY FOR YOUNG WOMAN IN EL PASO, TEXAS—25 to 35 years of age, experienced, well qualified secretarial-stenographer. Must have superior speed in taking dictation and transcribing notes rapidly and accurately. Must be willing, ambitious, hard working—and with pleasing personality and the ability to work with others. If interested write, giving full details of experience, ability, character references, etc., enclosing small recent snapshot or photo to: Mr. E. C. Held, President, Held Bros. Corp., P. O. Box 98, El Paso, Texas.

OPPORTUNITY FOR YOUNG MAN IN EL PASO, TEXAS—30 to 32 years of age—in El Paso, Texas. Must be fully qualified general bookkeeper. Able to handle general ledger, accounts receivable, insurance, income tax returns, and every phase of bookkeeping. Must be sober, industrious, ambitious and capable. Able to work well with others. Knowledge of Spanish helpful. If interested write, giving full details of background, experience, character references, references as to ability, etc., and enclose small recent snapshot or photo. Mr. E. C. Held, President, Held Bros. Corp., P. O. Box 98, El Paso, Texas.

BUSINESS OPPORTUNITIES

FOR SALE—30,000 GALLON ANHYDROUS ammonia bulk plant. Practically new. Handled approximately 15 car loads. Bargain. Terms if desired. Address Ad No. 5102, Croplife, Minneapolis 40, Minn.

MACHINERY FOR SALE

FOR SALE

Complete Granulating Equipment
I. C. Bogging Unit
Fisher Porter Meter & Recorder
All in good condition
Dixie Fertilizer Co., Inc.
Box 1111 Shreveport, La.

Aug. 25—Fertilizer industry tour, Miami County, Ohio, NPFM sponsored.

Aug. 26-28—Soil Conservation Society of America, 14th Annual Meeting, Rapid City, S.D.

Aug. 28-29—Southeast Fertilizer Safety School, Heart of Atlanta Motel, Atlanta, Ga.

Aug. 28-29—Minnesota Agricultural Ammonia Institute, University of Minnesota, St. Paul, Minn.

Aug. 30-Sept. 3—American Institute of Biological Sciences annual meeting, Pennsylvania State University, University Park, Pa.

Sept. 3-4—Fertilizer Salesmen's School, North Carolina State College, Raleigh, N.C.

Sept. 10—New pesticide review for Central California, sponsored by Western Agricultural Chemicals Assn., Fresno Fairgrounds, Fresno, Cal.

Sept. 13-18—American Chemical Society, national meeting, Haddon Hall Hotel, Atlantic City, N.J.

Sept. 17—New Jersey Fertilizer Conference, Rutgers University, New Brunswick, N.J.

Sept. 20-23—Seventh Annual Meeting Canadian Agricultural Chemicals Assn., Chateau Frontenac, Quebec City.

Sept. 24—Fertilizer Technology & Economics School & Tour for California Bankers, University of California, Berkeley, Cal.

Sept. 24-25—Annual North-Eastern Fertilizer Conference, NPFM, Biltmore Hotel, New York, N.Y.

Sept. 25—Annual Crops Day, University of Arizona, Safford, Ariz.

Sept. 28-Oct. 1—Fourth Southeastern Fertilizer Conference, Atlanta Biltmore Hotel, Atlanta, Ga.

Oct. 12-14—Association of Official Agricultural Chemists, annual meeting, Shoreham Hotel, Washington, D.C.

Oct. 13-14—Western Agricultural Chemicals Assn., fall meeting, Villa Motel, San Mateo, Cal. C. O. Barnard, executive secretary.

Oct. 14-16—Pacific Northwest Plant Food Assn. Annual Convention, Chinook Hotel, Yakima, Wash.

Oct. 15—NPFM Conference on Chemical Control Problems, Shoreham Hotel, Washington, D.C.

Oct. 16—Association of American Fertilizer Control Officials, Shoreham Hotel, Washington, D.C.

Oct. 16-17—American Pesticide Control Officials, annual meeting, Shoreham Hotel, Washington, D.C.

Oct. 19-23—Fertilizer Section, National Safety Council, annual meeting, Chicago.

Oct. 21-23—National Agricultural Chemicals Assn., 26th annual meeting, French Lick-Sheraton Hotel, French Lick, Ind., Lea S. Hitchner, executive secretary.

Oct. 27—Seventh Annual Grassland Farming Conference, Extension Service, Rutgers University College of Agriculture, New Brunswick, N.J.

Nov. 4-5—Fifth Annual Oklahoma Fertilizer Dealers and Crops and Soils Conference, Stillwater, Okla.

Nov. 4-6—Fertilizer Industry Round

CALENDAR FOR 1959-60																					
AUGUST					SEPTEMBER					OCTOBER					NOVEMBER						
S	M	T	W	F	S	M	T	W	F	S	M	T	W	F	S	M	T	W	F		
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Table, Mayflower Hotel, Washington, D.C. Dr. Vincent Sauchelli, National Plant Food Institute, chairman.

Nov. 8-10—National Fertilizer Solutions Assn., Annual Convention, Statler Hilton Hotel, St. Louis; Muriel F. Colle, 2217 Tribune Tower, Chicago 11, executive secretary.

Nov. 9-11—California Fertilizer Assn., 36th annual convention, Fairmont Hotel, San Francisco.

Nov. 16-20—National Aviation Trades Assn., 20th annual convention, New Orleans, La.

Nov. 30-Dec. 4—27th Exposition of Chemical Industries, New York Coliseum, New York City.

Nov. 30-Dec. 5—Joint meeting, Entomological Society of Ontario; Entomological Society of Canada and Entomological Society of America, Hotel Sheraton-Cadillac, Detroit, Mich.

Dec. 1-2—Annual meeting, Carolinas-Virginia Pesticide Formulators Assn., Carolina Hotel, Pinehurst, N.C.

Dec. 2-3—Annual Missouri Fertilizer Conference, Columbia, Mo.

Dec. 7-10—Central Canada and North Central Weed Control Conferences, Royal Alexandra Hotel, Winnipeg, Manitoba, Can.

Dec. 8-10—Joint Meeting of Western Canadian and North Central Weed Control Conferences, Winnipeg, Manitoba.

Dec. 9-11—International Crop Protection and Pest Control Exhibition, Seymour Hall, St. Marylebone, London, England.

Dec. 10-11—Annual Arkansas Plant Food Conference, Little Rock, Ark.

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